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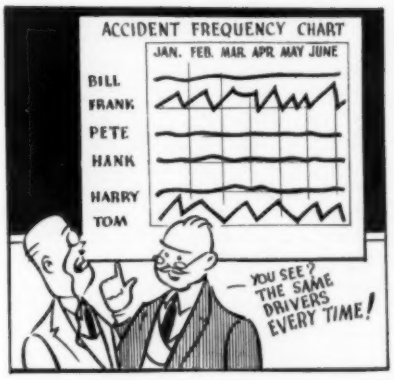
ACCIDENT CAUSES In Motor Fleet Operation

By FRED E. KUNKEL

CARELESS DRIVING, rather than speed, found to be main cause of accidents in one company's investigation. Same men had accidents with regular frequency. Intelligence test of accident-prone drivers showed their surprisingly low mentality. Their transfer to other work only resulted in personal injuries instead of vehicle accidents



"WE THOUGHT accidents were matters of chance, the weather, car condition, etc.," explained the fleet superintendent of a telephone company recently interviewed, "but after thorough investigation we found that a certain group of men contribute each year about 50 per cent of the accidents.

"Take a group of 50 drivers with 30 accidents a year. We found that the men who drove the greatest mileage didn't necessarily have the most accidents. Speed was found not to be a factor. Neither governors nor other traffic devices stopped accidents. Whether passenger car or truck, the record was the same.

As our studies progressed, we saw no hope for controlling accidents with some outside pressure, such as speed reduction or teaching them to drive carefully, or inflicting penalties. No matter what form our efforts took, our record did not indicate any chance of changing the accident-prone driver.

As a basis for obtaining a record we started with accidents reportable to an insurance company, and we did not classify other accidents. The question came up: Whether a man should be charged with accidents when he was not driving? The contention by the men and the supervisor was that his record should not be charged with any accident which occurred while the car was in a stop position.

But we found that the same men were having accidents, either in parking, or after having parked, or being bumped into the rear by stopping suddenly and unexpectedly. So we decided to classify them as accidents, too, and charge the men with them.

We found that these accident-prone men did not use good judgment as to whether to park near a busy corner instead of a side street, or in parking double in the most impossible places. If they came to a sudden stop they never used an arm signal. They always took chances on their brakes stopping the car in plenty of time, with the result that a rear-end collision was inevitable. They simply lacked judgment.

We also found that the mechanical condition of the car was not a factor in accidents in its operation. We didn't find any difference in moving a man from an old car to a new car. There was absolutely no change in the way of improvement in that man's accident rate.

The big point was: how should it be corrected? We soon found that you cannot educate that man into having fewer accidents. In the first place, you cannot tell what caused the

accident. You can read hundreds of accident reports in an insurance company office and talk to the men afterwards. You can limit your investition to your own group, and the result is the same.

Regardless of a man's honesty, he naturally reports the accident in the most favorable light. You cannot take an accident report and believe it. One man will only see a portion of it.

Psychology is a peculiar thing. It is intangible, unreliable. One man has his version, and the man with whom he was involved in an accident has still another version. The two stories never agree. And, in all these cases we made no attempt whatever to place the blame. We couldn't.

An intelligence test of five accident-prone drivers showed that four of them were definitely feeble-minded and had the intelligence of an eight-year-old boy.

You can talk about reckless driving and speed, and all that, but what constitutes reckless driving? That is the real trouble—finding the exact definition. You can say that someone does not drive as carefully as you do, but speed has nothing to do with it. You cannot find anyone who can really define reckless driving. You cannot legislate it. A plan used in Rhode Island which has considerable merit does not permit a man to drive any more on the public highway after he has a certain number of accidents.

And so we came to the conclusion that it was not a question of reduction of speed, or of brake inspection, or of weather conditions—nothing at all except the unsafe driving by a man who is not fit to drive.

So we began looking for accident frequency. We took a group of accident-prone drivers and attempted a prediction. Accidents were plotted in one direction, and time in another. And we could soon accurately predict when that driver would have his third, fifth or seventh accident. The curve was generally a straight line.

The startling thing about this graph was the striking accuracy with which these predictions came true. Only occasionally did we find a man who deviated from this law of expectation. The study turned out not only to be true, but it was exceeded. And from that time on, we began to look to men rather than equipment or the factors surrounding the accident.

Having discovered that it was the men who caused the accidents and not the equipment or road hazards, we made certain efforts to censure the men and to inflict penalties such as giving them a job they didn't like to do for a couple of days or a week, or laying them off. Not a financial penalty to be paid to us, but demoting them for two weeks or a month. Then we also tried to reward them for careful driving, but we could not change the total number of accidents.

This reward idea is interesting. For a good month without accidents we awarded $1 to each driver, $2 for the next month, and so on. But we soon found out that the only thing we were doing was to pay the good drivers more money, whereas it had no effect on the poor drivers at all.

Having tried educational methods, penalties and rewards, and finding them all wanting, we next attempted to find something in the men that would account for their accident-prone condition. We took five of them to the department of psychology of a nearby university for mental examination. Four out of the five had averaged four major accidents a year.

The tests made at the university showed they were definitely feeble-minded and had the intelligence of an eight-year-old boy. The fifth man had intelligence but he had trouble with his vision, which could not be corrected by glasses. After these findings we had openings for five more men. And it was the only sound basis by which we were able to affect that accident rate. Thus we rid ourselves of those who were responsible for 50 per cent of the accidents year after year. We replaced these accident-prone men with drivers who met the test, and then transferred accident-prone drivers to other types of work.

This again proved a mistake. That didn't pay either. We found that a man prone to have accidents on the road should not be transferred elsewhere, because his carelessness carried right over into personal injury. We found he substituted personal injury accidents in lieu of traffic accidents. In fact, one of the men driving his own car was involved in an accident later that cost two lives. Another met with accidental death in his own machine.

What happens to men when transferred from traffic to non-driving jobs? They have accidents just the same. It is not the fault of the individual really, but something he can not control. He is not morally responsible, nor can he be cured. The only thing that will cure the accident rate in the plant or on the road is the elimination of the man who is accident-prone. You cannot place the blame on him—it is not a moral thing at all. The man is not to blame for something he cannot help.

The intelligence test used by the university takes about 30 minutes. It is frequently called the Morgan test and those taking it are asked simple questions. The answers to what appear to be simple questions are amazing. For instance: "The sun rises in the .... and sets in the ...." These accident-prone drivers answered that question any number of ways. It showed them to be men of low mentality.

It was a shock to learn of their relatively low-grade mentality. Yet we tested them in our own way in casual conversation and could detect nothing wrong with them. Certainly there was nothing wrong with their appearance, for they were bright-looking and neatly dressed. You could not tell by looking at them or talking with them, for their conversation was apparently normal.

Since we made this shift as a result of this test, we have reduced our accidents 43 per cent in the first six months."

▼ ▼

Company Rewrites Preferred Stock at 5 Per Cent

Dr. C. L. Jones, secretary-manager of the Athens Home Telephone Co., Athens, Ohio, reports that during the past few weeks the company has been successful in rewriting more than a quarter of a million dollars of preferred stock, reducing the interest rate from 6 to 5 per cent.

The Athens company recently made arrangements for additions to its central office equipment in Athens, to be installed by June at a cost of $5,000.

In the Nation's Capital

By FRANCIS X. WELCH

Special Washington, D. C., Correspondent for TELEPHONY

ONE GUESS at the forthcoming report on the telephone investigation and some comments concerning it. . . . The Administration's attitude towards holding companies and the President's different statements as to his objectives. . . . The problem of the telegraph may turn out to be "big stuff"

FOR THE telephone industry, this is the "guess what?" period in Washington. A few days hence, the FCC will flash the report of its special telephone investigation upon a waiting world. Meantime, all the Washington observers must sit around and either guess or pretend to know something or other about what is coming.

Of more than passing interest, however, was a little piece that appeared in Newsweek of January 17, because it probably resulted from a brief visit which the contributing editor of that publication made with some Washington friends a few days ago. The editor, in case you don't know him, is Raymond Moley; and when he shops for Washington news, he knows where to shop.

Because Newsweek is a bit finicky about having some of its stuff quoted elsewhere, you'll have to read the original yourself. However, it was to the general effect that the special investigation report won't amount to much by way of big news; that the recommendations for legislation will be minor and the report, as a whole, will simply reflect the gist of the hearings.

The telephone industry, in short, will be let off with a mild scolding and what amounts to a certificate of good standing. The principal value of the report will be in the enunciation of future commission policy.

There is an excellent chance that Newsweek is a bit optimistic, or pessimistic (depending on your point of view) but on the whole, judging by past performances, Brother Moley's weekly has a pretty high batting average on Washington prognostications.

Yet, it does seem to this writer that the report can scarcely escape the inclusion of some pretty stout recommendations for the regulation of Western Electric and about the control of equipment expense generally. It is also notable that the FCC library has had a brisk run on several works dealing with the subject of depreciation which nobody is likely to be reading just for the thrill of the thing. And the Bell is too tempting a target for a New Deal agency to forego, at least, a lecture on the dangers of monopoly.

GENIAL Jim Farley has little enough to laugh about these days, with his once fond hopes of the governorship of New York being blasted right under his nose by the Jackson-for-governor boom (which everybody concludes must have the blessing of "the chief"). But when Mr. Jackson recently met one Wendell L. Willkie (Commonwealth & Southern) in a broadcast debate under the auspices of the Town Hall of the Air, big Jim got more enjoyment out of the program than he will admit to his closest friends.

Just how or why those responsible for the handling of Mr. Jackson's candidacy allowed him to meet such a smooth conversationalist as Mr. Willkie over a coast-to-coast hook-up is somewhat of a mystery. If you heard the broadcast, you will recall that there were cheers—actually cheers—for Mr. Willkie, while the audience seemed distinctly cold towards Mr. Jackson's efforts.

This in itself was both surprising and puzzling to the administration's political strategists who have heretofore depended on a utility spokesman being unpopular. Apparently, the utilities have come a long way in their public relations since the dark days of 1934 when, as one caustic observer remarked, "utility executives have just about enough influence in Washington to get admitted to the men's room in the Union Station." But that's another story.

THE SORE point about the Jackson-Willkie debate with the Administration Warwicks is the fact that the reaction of this obviously unsympathetic audience—a New York City audience, mind you—was permitted to go out over a national hook-up.

Naturally, this was definitely bad. It may not strike you as so important because you are not in politics, and, therefore, not so sensitive to the publicity values and the possibilities of popular reaction. But smart and sympathetic publicity is a matter of life and death to the aspiring politician.

And the reaction to the Jackson-Willkie program was not only injurious to the candidacy of a man who expects to be elected governor of New York, but it reflected somewhat on the New Deal as a whole. Small wonder that Jackson's board of strategy was due for a good wigging from headquarters. But genial Jim Farley, as stated before, didn't mind too much, for reasons of his own.

Mr. Jackson's general attitude toward business—not only in his debate with Mr. Willkie, but in other utterances before and since that occasion—check pretty well with what was said in this department two weeks ago about the New Deal's increasing antipathy towards big business. What President Roosevelt told the press about holding companies

last week was a more recent and significant manifestation.

It's Mr. Roosevelt's privilege to change his mind, of course, but one wonders if he has not been a little less frank in revealing his objectives with respect to holding companies.

YOU WILL, perhaps, recall his remarks made during the hectic days of August, 1935, when the public utility holding company bill reached the President's desk after a furious battle in Congress over the so-called "death sentence." (If you're a New Dealer strike out the words "death sentence," and substitute the words "rejuvenation section.")

In a magnanimous mood, Mr. Roosevelt gave the country to understand that that bill was about all he wanted in the way of holding company reform. He went further and hinted that the utility industries wouldn't find it such bad medicine when they got around to taking it.

That was August, 1935. Now, two and a half years later, the President tells the press that he is out for the scalps of all holding companies. It doesn't make any difference whether they're in the utility business or any other kind of business. (Ma Bell, please take notice, by the way. You're in on this!) And it doesn't make any difference whether they are top holding companies or bottom holding companies, or intermediate holding companies. They've got to go.

And why? Because they represent, says the President, remote control, which he thinks is bad for the country. It stifles local ambition. Local managements can't do a thing without clearing their ideas through New York. Wall Street, the pernicious octopus of so many political campaigns, is trying to run the country. But Mr. Roosevelt will save us. He will slay the octopus.

It sounds very fine. But there is another side to the argument. And if you read this writer's lines about the anti-bigness theory two weeks ago, you have already guessed what it is. Mr. Roosevelt is not really out to kill the octopus. What he really wants to do is change its address from New York to Washington. Government—the Federal government—can more easily dominate every phase of our national political economy if it is broken up into little pieces.

Big units, holding companies, are hard on bureaucratic digestion. So we'll get rid of the holding companies, and then all business will be just a pushover for government control. Meanwhile the Federal government would itself become, in a sense, the biggest monopoly this side of Moscow.

COMING CONVENTIONS

Minnesota Telephone Association, Radisson Hotel, Minneapolis, January 25, 26 and 27.

Texas Telephone Association, Adolphus Hotel, Dallas, March 23, 24 and 25.

Oklahoma Telephone Association, Huckins Hotel, Oklahoma City, March 29 and 30.

Missouri Telephone Association, Hotel Muehlebach, Kansas City, April 4 and 5.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, April 12, 13 and 14.

Nebraska Telephone Association, Hotel Paxton, Omaha, April 19 and 20.

Kansas Telephone Association, Topeka Hotel, Topeka, April 27 and 28.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, May 3, 4 and 5.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 11 and 12.

Wisconsin State Telephone Association and Wisconsin Locally Owned Telephone Group, Park Hotel, Madison, May 17, 18 and 19.

Pennsylvania State Telephone & Traffic Association, Yorktowne Hotel, York, June 2, 3 and 4.

New York State Telephone Association, Seneca Hotel, Rochester, June 7, 8 and 9.

WITHOUT being too dogmatic and trying not to editorialize too much, it is difficult to see just how such declarations coming from the White House at this time are supposed to dissipate the "fear" which, the President has told us, is mostly responsible for the present recession.

If investors are afraid to invest, thereby retarding construction and expansion, the obvious, fundamental course for the government to follow would seem to be to try to give the investors something to be confident about. And it would seem to be the specific task of those who sold big business down the river for the last five years to try to sell America back to the Americans today.

Furthermore, one may well wonder whether the President is accurately advised as to facts before he indulges in such sweeping generalities as the four-inch tail wagging the 96-inch dog. His information about $600,000,000 controlling $13,000,000,000 in utility capital apparently was from a study made in 1932, "The Holding Company," by Bonbright & Means. If this is true, a little annotation is badly needed at the White House.

What Washington reporters are wondering about is whether Mr. Roosevelt just happened to get all wound up and was sounding off on his pet obsession—the utilities—or whether he really has something up his sleeve in the way of specific legislation to be trotted out in the near future. In either event, this writer is inclined to the view that Mr. Roosevelt by this time has heard enough to make him pause before making an overt move toward cutting off the corporation dog's tail "just behind the ears," as one reporter phrased it.

AND LOOKING at the whole mad situation in retrospect, one also wonders just how long the American people are going to be fascinated by this continuous fireman-save-my-child act that is so often pulled on the Washington stage. When we look back and see the parade of terrible catastrophies from which Mr. Roosevelt has rescued the American people just in the nick of time, it's a fair question to ask whether the American people might finally begin to suspect that some of the villains are "phonies."

We have been rescued from the utility holding company for bankers, from the lawyers, from the dust storms and from the newspaper publishers. And now we are about to be rescued from the utility holding companies all over again. Unless one likes this sort of performance very well, it seems both the time and place for Mr. Average American to get up and say ,"I came in here," and forthwith walk out on the whole show.

The whole situation might aptly be summed up in a remark made last week before the Senate unemployment committee by Wilson Compton, manager of the National Lumber Manufacturers' Association. Said he: "If this administration has anything to shoot at in business, it can use a rifle and shoot at what it is aiming at, instead of using a blunderbuss and scattering shot over everything and terrifying everybody."

SPEAKING of monopoly, the dissenting opinion registered last week by Commissioner T. A. M. Cra-

(*Please turn to page* 34)

Mathematics For Telephone Engineers

By H. H. HARRISON

ARTICLE EIGHT, SECTION VI, of mathematics series especially written for telephone engineers in handling alternating current problems. This section discusses complex angles of hyperbolic trigonometry

In transmission work, the complex angle is frequently encountered; that is, an angle such as $\angle (a + jb)$.

Now $\cos \alpha = 0.5\, \epsilon^{j\alpha} + 0.5\epsilon^{-j\alpha}$ as has been shown; therefore,

$$\cos (\alpha + jb) = 0.5\epsilon^{j(\alpha+jb)} + 0.5\epsilon^{-j(\alpha+jb)}$$
$$= 0.5\epsilon^{-b}\epsilon^{j\alpha} + 0.5\epsilon^{b}\epsilon^{-j\alpha}$$

This is set out in Fig. 173. Cos $(\alpha + jb)$ unlike cos α, is not a mere numeric but is a vector, since it has direction as well as magnitude. The reader will probably have difficulty in visualizing an angle having a real and an imaginary part, but he should bear in mind that a radius vector can alter in two ways:

(a) By a movement along its length, i. e., an increase or decrease in its magnitude.

(b) A movement at right angles (in quadrature) to itself, i. e., a rotation.

A vector which sweeps out a complex angle undergoes both (a) and (b) changes. An example of stretching or contracting, accompanied by simultaneous rotation, is furnished by the radius vectors of the exponential spiral. The quadrature movement is represented by a real circular angle while the in-phase movement is an imaginary circular or hyperbolic angle.

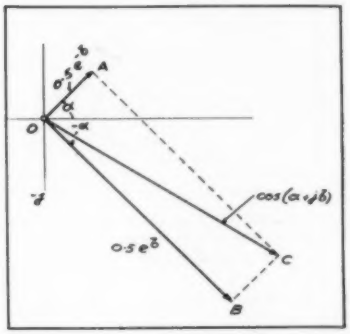


Fig. 173. Graphical Construction for Cos (a + jb).

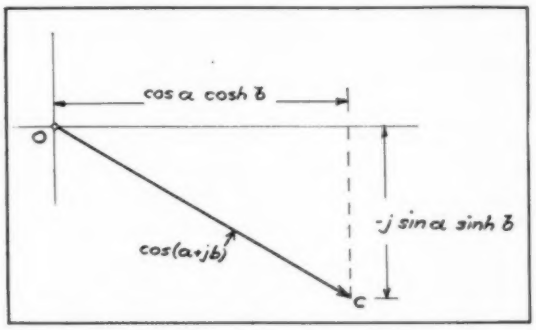


Fig. 174. Graphic Representation of Cos (a + jb) = Cos a Cosh b — j sin a sinh b.

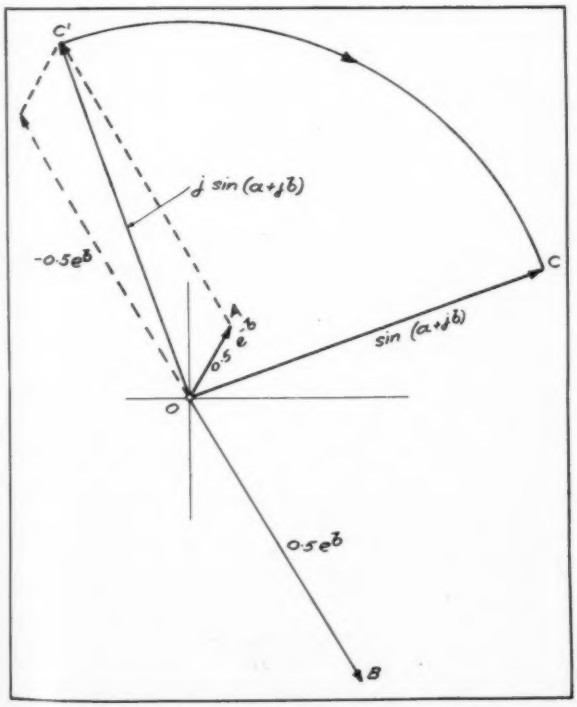


Fig. 175. Graphical Construction for Sin (a + jb).

The stretching results from the vector simultaneously rotating through the circular angle θ while its free end traces out a hyperbolic sector, as will be seen later.

Referring again to the expression cos $(\alpha + jb)$, it is known that cos $b = 0.5\ (\epsilon^{jb} + \epsilon^{-jb})$ and cos jb is an imaginary circular angle. Treating j as an ordinary algebraic quantity

$$\cos jb = 0.5\,(\epsilon^{j(jb)} + \epsilon^{-j(jb)}) \quad \ldots\ldots (1)$$
$$= 0.5\,(\epsilon^{-b} + \epsilon^{b})$$
$$= 0.5\,(\epsilon^{b} + \epsilon^{-b}) \quad \ldots\ldots (2)$$

The last expression, for reasons which will be apparent later, is called the hyperbolic cosine of the angle b and is denoted "cosh" b, pronounced as written.

Similarly,

$$\sin jb = 0.5\,(\epsilon^{j(jb)} - \epsilon^{-j(jb)})/j \quad \ldots\ldots (3)$$
$$= -0.5\,(\epsilon^{b} - \epsilon^{-b})/j$$
$$= j^2\ 0.5\,(\epsilon^{b} - \epsilon^{-b})/j \quad \text{(Remember } j^2 = -1\text{)}$$
$$= j\ 0.5\,(\epsilon^{b} - \epsilon^{-b})$$
$$= j \sinh b. \quad \ldots\ldots (4)$$

$0.5\ (\epsilon^{b} - \epsilon^{-b})$ is called the hyperbolic sine or "sinh" pronounced variously as written or as "shin" b.

Now treating j as an ordinary quantity,

$$\cos (\alpha + j\beta) = \cos \alpha \cos j\beta - \sin \alpha \sin j\beta$$
$$= \cos \alpha \times 0.5\ (\epsilon^{b} + \epsilon^{-\beta}) - \sin \alpha \times 0.5\ j\,(\epsilon^{\beta} - \epsilon^{-\beta})$$
$$= \cos \alpha \cosh \beta - j \sin \alpha \sinh \beta \ldots\ldots (5)$$

Calling cos α cosh β A, and $-j$

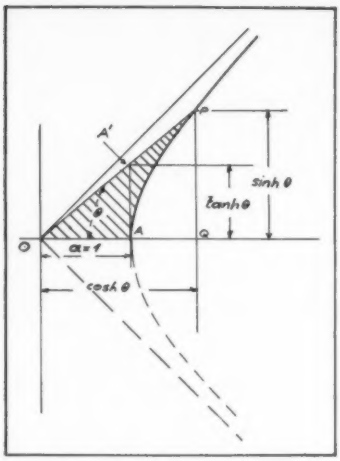


Fig. 176. Showing How the Hyperbolic Functions Are Derived from the Rectangular Parabola.

$\sin\alpha$ sinh β jB, then A and B are the horizontal and vertical components of the vector cos $(\alpha + j\beta)$. The construction of Fig. 173 may, therefore, be replaced by that of Fig. 174 which needs no explanation.

Let $y = \sin(\alpha + j\beta)$

$= (e^{j(\alpha + j\beta)} - e^{-j(\alpha + j\beta)})/2j$

$= -j(0.5e^{-\beta}e^{j\alpha} - 0.5e^{\beta}e^{-j\alpha})$

Referring to Fig. 175, draw OA $= 0.5e^{-\beta}$ at angle α, and OB $= 0.5e^{\beta}$ at angle $-\alpha$. Reverse vector OB to give $-0.5e^{\beta}$. The addition of this vector to OA gives the resultant OC′, which is j sin $(\alpha + j\beta)$. Rotating OC′ through the angle $-$ j gives OC $= \sin(\alpha + j\beta)$.

The alternative construction of Fig. 174 may also be used. Thus,

$\sin(\alpha + j\beta = \sin\alpha \cos j\beta + \cos\alpha \sin j\beta$

$= \sin\alpha \cosh\beta + j\cos\alpha \sinh\beta$

$= A + jB$

the vertical component now being positive.

The reader should experiment with cos $(\alpha \pm j\beta)$ and sin $\alpha \pm j\beta)$ taking as values $\alpha = 45° = 0.7854$ radians and $\beta = 1.1$ and using both constructions as a check on each other.

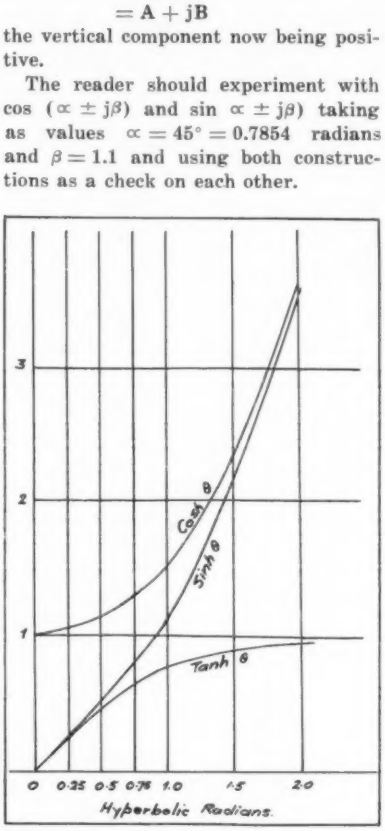


Fig. 177. Graph Values of Sinh θ, Cosh θ + Tanh θ.

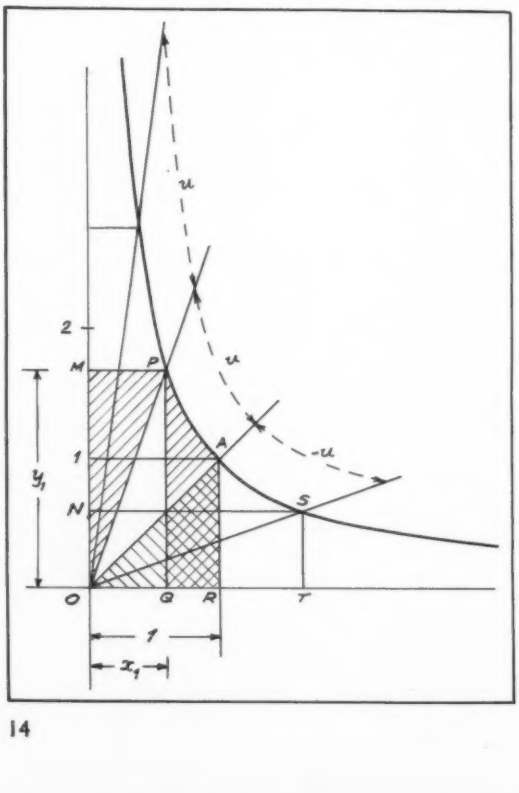


Fig. 178. Showing That When r = 1, θ in Radians Is Numerically Equal to the Number of Square Units in the Shaded Areas.

Fig. 179. Method of Obtaining the Area of a Hyperbolic Sector Corresponding to the Angle u.

The Hyperbolic Functions

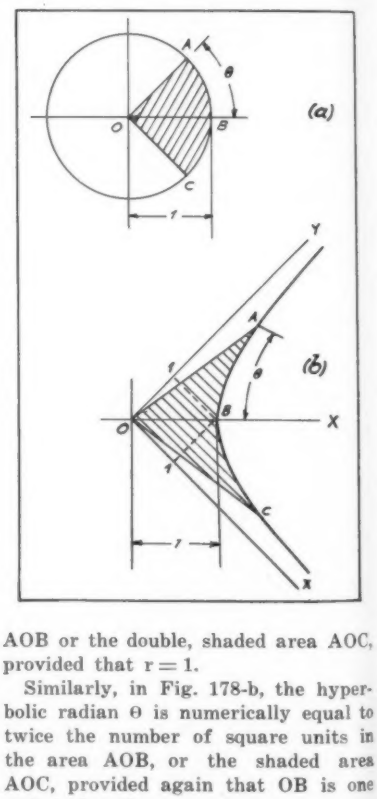
Referring to Fig. 176 the positive branch of a hyperbolic curve is shown, and OP is a radius which terminates on the hyperbola. In moving from the initial line OA, OP stretches and rotates at the same time.

The ratio PQ/OA is termed sinh θ and that of OQ/OA, cosh Θ. The ratio PQ/OQ $=$ AA′/OA $=$ tanh Θ and this could have been derived from sinh Θ/cosh Θ $=$ (PQ/OA)/(OQ/OA) $=$ PQ/OQ $=$ AA′/OA. The last result illustrates one of the many analogies between the hyperbolic and the circular functions of plane trigonometry.

Fig. 177 gives the values of the three hyperbolic functions for different hyperbolic angles. It will be noted that when Θ $=$ O, cosh Θ $=$ 1 just as cos O° $=$ 1. Sinh Θ when Θ $=$ O is O, corresponding to sine O° $=$ O.

The hyperbolic tangent tanh Θ, however, approaches a maximum value of 1 as Θ increases. This is due to the fact that sinh Θ and cosh Θ approach each other as Θ increases and their ratio, therefore, approaches unity.

In the circle of Fig. 178-a $\angle$AOB $=$ θ radians. The angle expressed in radians is equal numerically to the number of square units in twice the sector



AOB or the double, shaded area AOC, provided that r $=$ 1.

Similarly, in Fig. 178-b, the hyperbolic radian Θ is numerically equal to twice the number of square units in the area AOB, or the shaded area AOC, provided again that OB is one unit in length.

The reader will remember that it has already been proved that $\Theta = 2A/r^2$

radians and, if r is taken as unity, $r^2 = 1$ and $\Theta = 2A$.

In Fig. 178-b, OY, OX, which are the lines on which the x and y components of a point on the curve are marked, are known as the *assymptotes*, and a hyperbola so drawn is said to be "referred to its assymptotes."

Now the initial radius OB = r—although it is the unit taken when obtaining values of cosh Θ, sinh Θ, etc.—is actually $\sqrt{2}$, since it is the diagonal of the square formed by the projection of OB onto the x and y axes at x = 1, y = 1, as shown by the dotted lines. Therefore, $\Theta = 2A/r^2 = 2A/(\sqrt{2})^2 = A$, which is half the shaded area of Fig. 178-b.

In Fig. 179 a method is given for obtaining the area of the hyperbolic sector POA.

The area AOP = PQOM + PQAR —MPO — AOR ..... (1)

From the properties of the hyperbola, the area of triangles MPO and AOR are equal. Their sum is thus PQOM and (1) becomes

AOP = PQOM + PQAR — PQOM and AOP = PQAR.

Now the area of

$$PQAR = \int_{x=x_1}^{x=1} y \cdot dx = \int_{x_1}^{1} \frac{1}{x} \cdot dx/x$$

since $1/x = y$

$$= \log_\epsilon 1 - \log_\epsilon x_1 = \log_\epsilon \frac{1}{x_1}$$

$$= \log_\epsilon y_1.$$

Now $y = \epsilon^u$ and if u = O, y = 1. If u = 0.5, y = 1.6487, and if u = 1, y = 2.7183.

For negative hyperbolic angles,

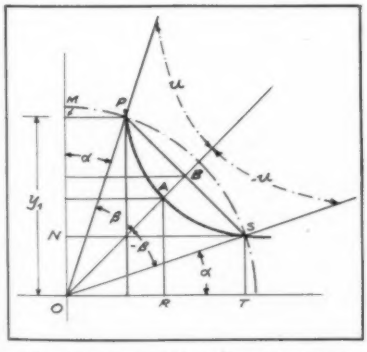


Fig. 180. Geometrical Proof for Cosh u and Sinh u.

$y = \epsilon^{-u}$ and for u = —0.5, y = 0.6065 while for u = —1, y = 0.3679.

Ordinate OM represents ϵ^u for u = 0.5 and ordinate ON that for $\epsilon^{-u} = -0.5$.

Fig. 180 has been abstracted from the previous figure to furnish a proof of the formula for cosh u and sinh u. The hyperbola is, as before, represented by the equation xy = 1. By definition,

$\cosh u = OB/OA = OB/\sqrt{2}$

$\sinh u = BP/OA = BP/\sqrt{2}$

Further,

$\cos\beta = OB/OP$

$\cos\alpha = OM/OP$

$= \cos(45° - \beta)$

$= \cos 45° \cos\beta + \sin 45° \sin\beta$

$= (1/\sqrt{2}) \cos\beta + (1/\sqrt{2}) \sin\beta$

$= 0.707 (\cos\beta + \sin\beta)$

Also,

$\cos(\alpha + 2\beta) = \cos(45° + \beta)$

$= 0.707 (\cos\beta - \sin\beta)$

$= ON/OS = ON/OP$

OS = OP because $\beta = -\beta$.

$OM = OP \cos\alpha = OP \times 0.707$

$(\cos\beta + \sin\beta)$ ..... (A)

$ON = OP \cos(\alpha + 2\beta) = OP \times$

$0.707 (\cos\beta - \sin\beta)$ ..... (B)

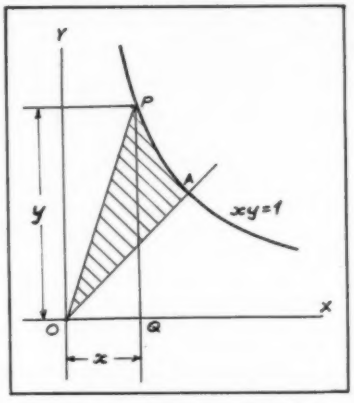


Fig. 181. To Find the Value of u Given Θ.

Adding A and B,

$OM + ON = 1.414 \times OP \cos\beta$

$= \sqrt{2}\ OP \cos\beta$

$= \sqrt{2}\ OP \times (OB/OP)$

$= \sqrt{2}.OB.$

Therefore, $(OM+ON)\sqrt{2} = (\sqrt{2}OB)/2$

$= OB/\sqrt{2}$

$= \cosh u.$

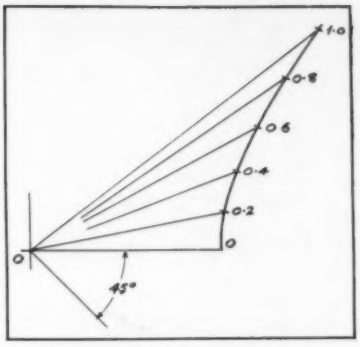


Fig. 182. A Hyperbolic Radian With Five Sub-Divisions.

Subtracting A and B,

$OM - ON = 1.414\ OP \sin\beta$

$= 2.OP \times BP/OP$

$= \sqrt{2}\ BP$

and

$(OM - ON)/2 = BP/\sqrt{2} = \sinh u.$

The geometrical proofs of Figs. 179 and 180 are due to Dr. A. E. Kennelly, who has done more than any other writer to stimulate the application of hyperbolic trigonometry to electrical engineering problems.

The following simple method for finding the value of u corresponding to a given real angle Θ is given by Gheury de Bray.

Referring to Fig. 181, suppose that the hyperbolic angle u corresponding to ∠20° is to be ascertained.

If angle POA = 20°, then ∠POQ = 20° + 45° = 65°.

Now xy = 1 and $y = x \tan 65° = 2.1445\ x$.

$x = y/2.1445$ and $xy = y^2/2.1445 = 1$, or $y^2 = 2.1445$ and $y = 1.464 = \epsilon^u$.

Therefore, $u = \log_\epsilon 1.464 = 0.3812$ nearly.

This result may be used to graduate a hyperbola in hyperbolic radians. From the above, $y = \epsilon^u = \sqrt{\tan\Theta}$

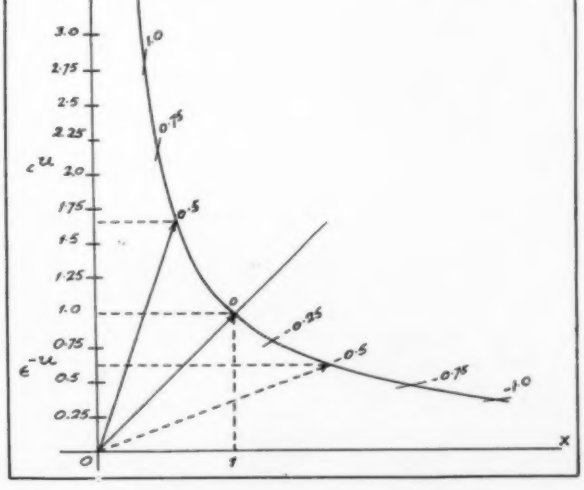


Fig. 183. Showing Chart of the Projection of e ± u on to the Curve xy = 1 Gives u in Hyperbolic Radians.

where $\Theta = (45^\circ + \phi)$. Therefore, for any angle ϕ, tan $(45 + \phi) = (\epsilon^u)^2 = \epsilon^{2u}$ from which

$$u = 0.5 \log_\epsilon \tan (45 + \phi)$$

Put $u = 0.6$ say, then $0.6 = 0.5 \log_\epsilon \tan (45 + \phi)$ and

$$1.2 = \log_\epsilon \tan (45 + \phi)$$

$\tan (45 - \phi) = 3.32$

$(45 + \phi) = 73.30$ and $\phi = (73.3 - 45)\ 28.3^\circ$

Thus given u, ϕ can be found and vice versa.

Fig. 182 shows a hyperbolic radian with five sub-divisions obtained by ϕ calculating the circular angles for different values of u less than unity and drawing lines from O at angles ϕ to cut the hyperbola represented by $xy=1$.

Yet another method is given by Fig. 183. Here the vertical line OY is graduated in terms of ϵ^u and ϵ^{-u}. The projection of any point on the OY axis on to the hyperbolic curve represented by $xy = 1$ cuts the hyperbola at a point u radians.

Since the hyperbola meets its asymptotes only at infinity, it is evident that the circular angle cannot exceed 45°. Also, the reader will have observed that whereas one circular radian is exactly the same length in the same circle as another, this is not so for the hyperbolic radian. The geometrical lengths of the arc increase while the circular movements of the generating vector decrease. There is, therefore, no unit hyperbolic radian as the unit varies with the circular angle.

(To be continued)

▼ ▼

Erecting New Building at Glendale, Calif.

In preparation for installation of dial telephone service in Glendale, Calif., the Southern California Telephone Co. has begun construction of a new building back of its present central office building. Cost of the land and new building will be approximately $208,000. The initial program, which will result in the conversion of about one-half of the exchange's telephones to dial service, will entail a total expenditure of around $1,200,000 and will require more than a year to complete.

Direct dialing will then be possible between extended service telephones of the Glendale system, adjacent districts of the Los Angeles exchange and the Pasadena exchange. Glendale extended service telephones will also be able to dial all telephones in the southern portion of the Burbank exchange.

Extended telephone service for the Santa Monica and Los Angeles districts went into effect the first of January. The service, which is optional, will save subscribers about $26,000 yearly.

The Operators' Corner

By MRS. MAYME WORKMAN

Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

KEEPING voice highways clear is a joint responsibility of all toll operators. Series No. 315

THE VOICE highways must be kept clear to permit messages to pass through promptly with the least possible delay, therefore, the proper clearance of toll circuits is a very important part of the toll operator's responsibility. This is a joint obligation on the part of all toll operators in every exchange.

The originating toll center operator is responsible for the clearance of a toll circuit which she has used in connection with the completion of an outward call, regardless of whether or not the originating toll center built up the circuit. However, if a circuit is built up to your office by an intermediate operator for the purpose of reporting on an NC Call Order, but is released without being used to establish a through switch, the originating toll center operator is not responsible for clearing the circuit.

The terminating toll center is responsible for the clearance of a toll circuit which she has built up for the purpose of passing a report on an Inward call if she does not reach the TX at the OTC. In addition, the TTC operator is responsible for the clearance of a toll circuit which she has built up for the purpose of securing the charge on an Inward collect call or for discussing the service.

The word "Clear" is used to indicate the action to be taken in order to make available to other operators a toll circuit which you have been using but no longer require. In some instances, this action consists merely of releasing the circuit; in others, it consists of ringing on the circuit and then releasing it; in still others it necessitates passing a verbal clearance order before releasing the circuit.

In order that built-up circuits may be cleared properly, operators should be provided with cord clips which should be used in the following manner:

When an operator becomes responsible for a ringing clearance she should attach a clip to the toll cord.

When the operator becomes responsible for a verbal clearance she should fasten the cords of the pair together with a cord clip as a reminder to clear the circuit.

Built-up toll circuits are cleared in the following manner:

(a) On a one-switch connection between toll centers, ring on the toll circuit and then release it.

(b) On a multi-switch connection, ring on the toll circuit and when the first intermediate operator challenges, say, "Clear to (distant toll center)." Release the circuit as soon as acknowledgment is received. However, if the toll circuit is connected to a ringdown trunk at the terminating toll center, say, "Clear to (called place)."

If the office at which the connection terminates challenges, say, "Clear this circuit," and after receiving acknowledgment, ring again and clear the circuit in the regular way. If an intermediate operator other than the first challenges, pass the clearance order to her and after receiving acknowledgment, again ring on the circuit, when the operator at the first intermediate office challenges, say, "Clear to (office to which clearance was passed)," and release the circuit as soon as acknowledgment is received.

The foregoing is in answer to question number four.

Questions from Illinois Operators

1. What is considered overtime on toll calls?
2. What is the correct phrasing in placing a Call Order for a busy number at a distant station?
3. What operator do you ask for when placing a Messenger ticket?
4. Explain the correct way to clear a toll circuit.
5. When having a call to a certain department where there is no PBX board, is it a personal call?

The answers to these traffic questions are given on page 30.

▼ ▼

Bell May Be Honored on U. S. Postage Stamp

Alexander Graham Bell, inventor of the telephone, is among the distinguished men who may be honored in future United States postage stamp issues.

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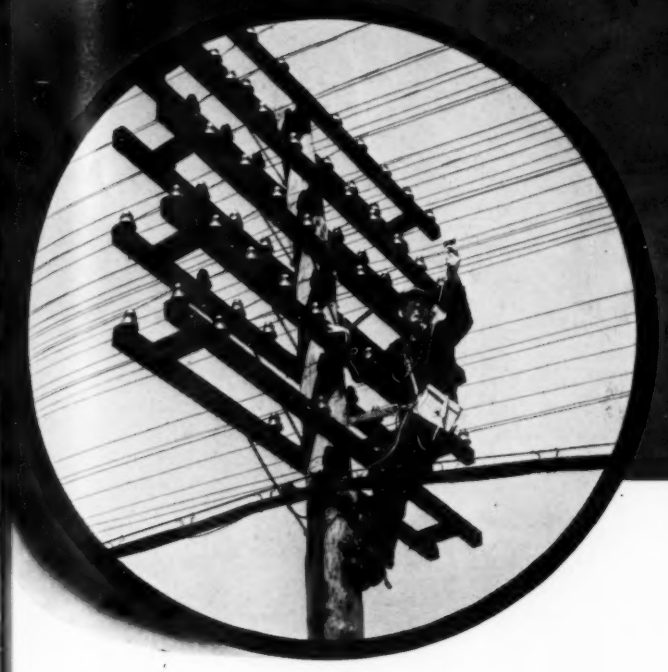

The list of products comprising our Complete Telephone Equipment and Supply Service includes, in addition to items of our own manufacture, construction materials and supplies of finest quality and highest reputation.

Typical of these are such products as "Copperweld" drop wire, "Klein" pliers, General Cable Corporation's "Standard Underground" telephone cable, American Steel and Wire Company's "Perfected Process" line wire, "Oliver" pole line hardware, "Plumb" hammers, "Seymour-Smith" tree pruners, etc., etc.

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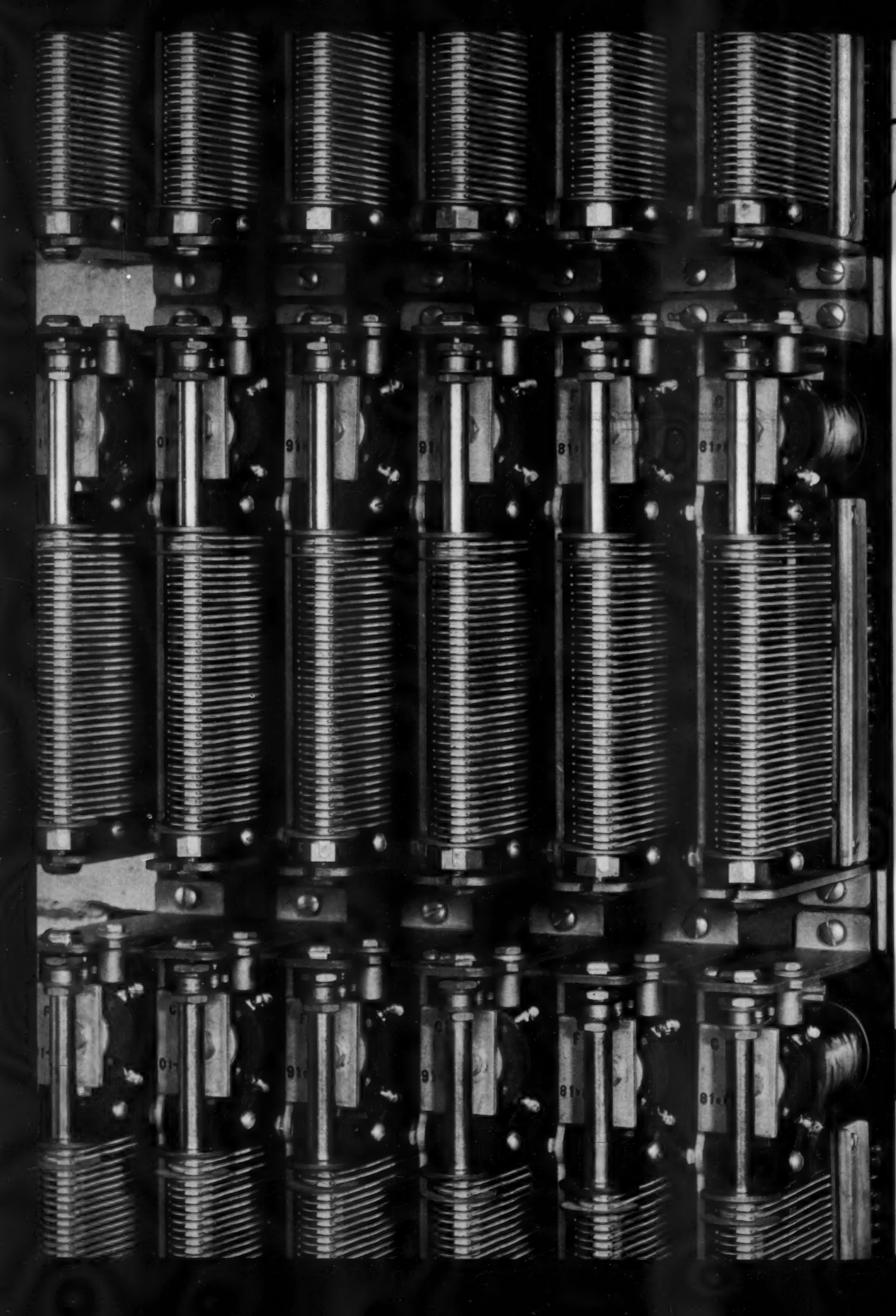

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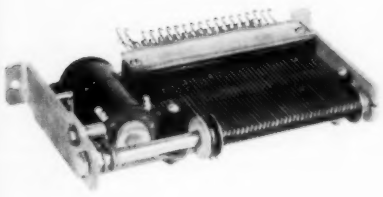

The new Automatic Rotor Relay has brought amazing simplicity and economy to the field of relay-type switchboard design. Utilizing a newly developed cam type of closure with self-cleaning twin contacts, the Rotor Relay accomplishes multi-contact circuit control positively and precisely, with very low expenditure of energy. Its simplicity of operating principle means unfailing reliability at all times. Equally important, it brings to the small exchange owner the latest development in automatic equipment at a **new low cost.**

What this new Rotor Relay will accomplish in the field of relay-type operation has been thoroughly proved in extensive and painstaking laboratory tests, and even these highly favorable results are being surpassed by actual service installations. Reports from telephone companies with switchboards of this type already in operation, say it's the smoothest running relay equipment they've ever had in service. Without question, the new Automatic Rotor Relay offers small exchanges the utmost in up-to-date, trouble-free relay switchboard service and **low cost** in both initial price and upkeep. Write for full information—*today!*

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New Intercommunication Sets Vs. Standard Telephones

By GABRIEL M. GIANNINI
President, Transducer Corp., New York

LOUDSPEAKING TELEPHONES have been developed by radio manufacturers for use on electric wires for intercommunication purposes in homes and buildings. Comparisons between this cheaply made equipment and standard telephone equipment. Is there an opportunity for Independent manufacturers to produce quality equipment of this radio type?

THE RECENT appearance on the market of new types of intercommunication systems using radio equipment has created an awkward industrial situation. While it is difficult at the present time to guess on the trend of this new industry and on its behavior with reference to telephony, nevertheless an attempt will be made to draw what now seem to be logical conclusions on the development of these new communication instruments.

The telephone industry was created and developed with the sound business principles characteristic of the American industry at the end of last century.

The materials and manufacturing methods employed were of the first grade throughout. The manufacturers had a single idea in mind—that of achieving success primarily by giving the public service and quality.

During two scores of years the telephone manufacturers found a continuously growing market with practically no price competition, and the companies grew larger and larger, making substantial profits and establishing sound market prices. The marketing practices also remained stable and conservative, and there was practically no price reduction without it being accompanied by reduction in the quality of the product.

Today, the cost of good private telephone equipment ranges between $30 and $90 per station. Reputable customers do not consider installing any cheaper type of instrument, and there is practically no loss of sales caused by price resistance. Cheaper telephones have been created and sold successfully by some manufacturers, but they have not been accorded a first-line position in the telephone industry. They survive and have their own market, just as there is a market for practically any other product in various price ranges.

Possibly the telephone manufacturing industry could have reduced production prices by adopting new methods of construction similar to those employed by the radio industry. The market requirements, however, apparently did not necessitate such a change. Probably the industry itself, having profitably operated for years and pioneered and developed by the same group of men, was very conservative and preferred to manufacture quality equipment, maintaining selling prices with good returns.

The picture of the radio industry today in the United States is quite different. Radio began its commercial development in a period of great instability following the World War. It was understood and pioneered by a group of dynamic young individuals who were anxious primarily to obtain results.

In the early days of radio a receiver was built substantially with the same type of parts as a telephone instrument at the time and also today. Screws and binding posts played a great part in the construction of a radio set, and each part was detachable and interchangeable.

However, the efficient labor-saving methods developed during the last 15 years caught hold of this new industry and, because of its youth, affected it in such a way that production costs were, in the period of a few years, slashed incredibly. This fact eventually started the price-cutting mentality peculiar of the radio market today. Price competition threatened to lower sales volume, and manufacturing methods were improved so as to further lower radio manufacturing costs.

It is well known that in the radio industry the average life of a manufacturer is shorter than practically any other similar industry in the United States.

About a year ago radio manufacturers realized that if they assembled one of the then new miniature permanent magnet speakers with a small two, three or four-tube amplifier, they had a loudspeaking telephone which they could sell to the public at a price comparable to the current telephone prices.

Without apparently giving much further thought to the subject, more than 25 manufacturers in the United States started making such equipment, using either individual wire circuits or electric light lines for carrying their signals. They attempted to sell this merchandise through department stores, and found that the sales forces of the stores were not in a position to handle the technical details of such a sale.

They tried to sell through radio jobbers, and found that radio channels are used primarily to handle packaged merchandise—like radios, refrigerators, etc.—which give practically no installation problems, since the antenna used with radio sets today is the greatest example of service inadequacy.

They endeavored to sell to the public through sales forces of their own, and found that the volume did not

warrant, in most cases, the carrying cost of distribution.

They attempted to interest business equipment manufacturers and distributors, and found that such channels were making a good profit on their own lines and were not anxious to add a new, and for them, complicated line.

They strove to interest manufacturers and distributors of telephone equipment, and found that telephone and radio people do not talk the same language. The telephone installation man, who is actually used to more complicated wiring than that in these new intercommunication systems, found himself at a loss when in front of an amplifier chassis with which he was entirely unfamiliar.

This drawback, however, could have been overcome easily if the various telephone manufacturers could have seen in intercommunication something on which they could have had the same margin of profit as in the standard lines of equipment. Instead, what they saw was only the non-reassuring picture of the large electrical manufacturers in the country rushing into the market in a price-cutting fashion, trying to sell to the public hastily-put-together units.

No wonder the telephone industry felt the urge of keeping away from handling this loudspeaking intercommunication equipment, which has most of the evils of the radio industry.

The situation described may seem a bit pessimistic, but we think it is, frankly, not very far from reality.

Let us however examine the situation with an objective point of view:

Assume that low-speaking telephony is just as old-fashioned as a crystal radio set with head-phones. This statement certainly will be defined as bold by a good many people who consider the telephone as being in its ultimate form, and by those who sincerely believe in the usefulness of privacy given by the conventional telephone.

The soundness of this belief we have tried to analyze, and found it applies only in a limited number of cases. Unless persons have developed a habit whereby, whenever they have to discuss confidential matters, they remove themselves far away from others to talk over a telephone, there seems to be no justified reason for such a widespread belief.

Let us analyze various cases:

BUSINESS: If a telephone conversation is carried on in a private office when no other person but the party telephoning is in the room, a loudspeaking telephone has an obvious advantage over the conventional telephone.

If there is a third party in the same office, it is almost impossible for the great majority of persons to transact any sort of business in an intelligent, effective and conclusive way and keep the bystander unaware of the business being transacted. In the majority of cases the result of the conversation will be ineffective and another call will be made when the third party has left the room, or the conversation will be carried on from a different instrument.

In such a case, a loudspeaking telephone would simply avoid the unnecessarily embarrassing part of the conversation.

New type of combination loudspeaking and transmitting instrument used for intercommunication purposes.

PUBLIC PLACES: Statistics have been published about unhealthy conditions sometimes found in booths. All telephone booths should be equipped with loudspeaking telephones only, and this applies also to hospitals and scores of other places.

HOUSES AND HOTELS: The noise level in houses and hotels is so low that it makes it quite impractical to carry on confidential telephone conversation in the presence of third parties. Although extension sets in homes save time and many steps, they do not secure absolute privacy, for others can listen-in on the conversation, the same as on a party line. The telephone in the majority of cases is used for communication and not for private conversation.

If we consider the foregoing facts, we find that the conventional telephone is only needed in some special cases, including primarily business establishments. The fact that for absolute privacy the conventional telephone is not entirely sufficient is shown by the large number of private booths existing in offices of all types. But we are not trying to advocate the complete abolition of the conventional telephone.

It is our deep conviction that within two or three decades a large majority of the telephones in the country will be loudspeaking. If the telephone industry were in a more competitive state than it is now, that time would probably be shorter; but the country has such a tremendous investment in the present telephone systems that it is not possible nor wise to render such equipment obsolete before it becomes unserviceable.

Besides, although the loudspeaking communication equipment is developed today to a point where it is entirely adequate for private network use, it is not on the other hand, advanced sufficiently to warrant its substitution for the conventional telephone.

There is a tremendous amount of research being done on two-way, high-gain amplifiers which should result in permitting the adoption of the loudspeaking telephone by conventional telephone networks, the press-to-talk switch being entirely eliminated. This switch, which is only partially necessary today, is the great drawback of loudspeaking communication.

But even after such amplifiers will be available, loudspeaking telephony cannot hope to make any headway unless it molds itself to sales distribution practices and methods of conventional telephony.

The people at large are so used to the regular telephone set that the only way to effectively and rapidly substitute loudspeaking telephony for conventional telephony is to put on

the executive's desk something that will resemble the familiar telephone instrument in color, in dimensions, in weight, and have the same characteristics.

The public must be given an instrument which will connect to the line like a telephone and not like a radio set. Such a type of loudspeaking telephone equipment will naturally be more expensive than the present loudspeaking intercommunication sets consisting of a radio cabinet and a cheap loudspeaker.

The public today does not yet fully appreciate the differences between these two instruments: one built to last 20 years as a telephone set, the other built to last only as the fashion lasts, which in the case of the ordinary radio receiving sets has proven to be about four years.

It is in the interest of telephone manufacturers to introduce into the market, before it is too late, a type of loudspeaking telephone, comparable in quality and construction with the conventional telephone, so as to educate the public to the idea of a better grade of merchandise and prevent the market for this development in communication from being ruined before it is really established.

Here and There in the Field

Telephone System at Santa Fe Terminal

By Charles W. Geiger

Completion of the modernistic downtown terminal of the Santa Fe Railway Co., in San Francisco, Calif., heralded the opening of another transportation era. On January 1 Santa Fe passengers, with a sniff of disdain for the old, slow ferries, climbed into new buses at the Santa Fe's Oakland (Calif.) passenger station and rode across the Bay bridge to the new terminal in the heart of the business district at 44 Fourth street, just south of Market street.

The new terminal is a one-story and mezzanine structure of steel and concrete and terra cotta, embodying ultra modern construction designs and the newest in waiting passenger accommodations and telephone facilities. Stationed in the terminal are two batteries of artistic telephone booths of mahogany construction to match the mahogany fixtures of the terminal. Each battery of four telephone booths also includes a wall desk with a light extending its entire length upon which the telephone directories are carried. Perfect lighting is thus provided for persons looking for telephone numbers or other directory information.

A special installation permits patrons to telephone telegrams to the Western Union Telegraph Co., with coin box provided for receiving the cost of the service.

A very attractive and convenient women's room is also provided with a special telephone, while telephones built into the walls of the terminal at the taxicab parking area on the north side of the building provide direct telephone communication with the taxicab company's headquarters.

A Western Electric public address system is used by the dispatcher in announcing the arrival and departure of all motor stages at the terminal. Loud speakers built into the wall are placed in all public rooms, and the mike and apparatus are installed in the dispatcher's office. The two dispatchers together with a large number of applicants for the job were given an audition just like auditions in radio stations and the two men who had the clearest and most pleasing voices were given the position as dispatchers.

The Santa Fe Terminal is also used as the San Francisco Terminal by Santa Fe trailways buses and the Burlington trailways buses, as well as the Key System buses, Sacramento Northern buses and other bus lines.

Telephones in recesses in the wall (at right) near the taxicab parking area afford quick communication with taxi headquarters.

▼ ▼

Subscriber Finds Romance and Humor in the Directory

"What's in a Name?" is the theme of a clever little story which Mrs. J. E. Johnson, a subscriber of the Cozad Mutual Telephone Co., of Cozad, Neb., was inspired to write after perusing the latest telephone directory issued last fall. The story follows:

"Cozad's new telephone directory contains some startling information. For example, the names Smith and Jones are considered to be the most common names in our country, but our berg lists only five Smiths and five Smidts and not a single Jones. The Jensens are listed to the number of 20 to take the prize.

The animal world is represented by Baer, Haug, Lamb and Stear, and the birds are represented by the Martens. You can have a Penn or Laier for them.

Our presidents are represented by Adams, Taylor, Pierce, Johnson and Hayes. Then there are names of a few signers of the Declaration of Independence in the local directory, namely, Bartlett, Clark, Lewis, Morris, Ross and Williams. We must not forget the English kings, George and six Henrys. Evidently, the compilers of the directory were partial to the Tory party.

Our favorite colors are Brown, Rhone and White. The leading flower is the Rose, and Almond is our favorite flavor. You can transact a deal in the German, Scott, Welsh or Latin languages if you so desire.

Then there is the Gardner who has

little work because of the Winters. We also have a Cooper who Hughes his barrels, then Sells them to the Miller. Besides, there are other workmen such as the Chandler, the Tanner, the Jobman and the Potter.

We have seven Marshalls who Shields us from the Lawless Harms that must be Faught against and they will help Cover them over.

If you are afraid of getting stuck in the Marsh and Myer, we suggest you move to York, which is listed six times. Then other towns of the state that are represented in the directory and not mentioned elsewhere are Allen, Arnold, Bassett, Craig, Henderson, Mead, Mitchell, Neligh, Ralston, Wallace and Weston. We find two counties, Douglas and Phelps, listed also.

Then we can offer quite a romance for a Young man of Cozad. The name of our hero might be Paul, Thomas or Cloyd. This Young man took his Darling out in his Ford and drove for Miles around Brownfields, over Brooks and through Dales in the early month of May. At times when he was about to confess his Love to her a pain would strike his Heart and his Pallet would stick in his throat. He had only Eaton the Syan of a Lemmon and drunk a Gill of Berry juice for several days.

The villain of our romance was the Foster mother who, although she could not Reed or Wright, declared she would Wedge herself between the young lovers and Weaver Webb and Turner from him.

At last the Abbott told our hero to Rouse up and to slide down the Bannister out of the Rowe of the contrary one, and to go get his Love and Walker

(*Please turn to page* 33)

AFTERMATH

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

WEBSTER defines "aftermath" as follows: "A second mowing in a season; that which follows any condition, circumstance, or emotion."

That is the best term I can think of, at the moment, for what happened to all the pretty Christmas trees after the holiday season was over—their fate, their finish, their aftermath.

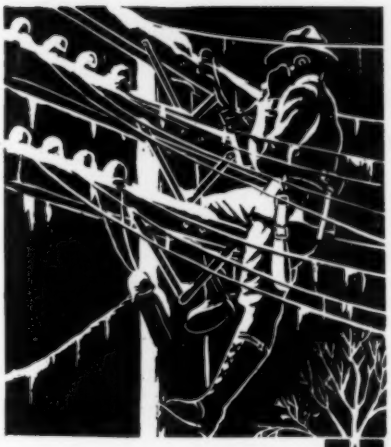
Setting up the Christmas trees and decorating them with many colored ornaments, lights, tinsel trimming, and gaily be-ribboned packages was a joyful occasion in homes, churches, and elsewhere. Little children danced and played around them in homes, day after day, while the holiday season lasted. But each day the Christmas trees grew less and less attractive, with the heat causing their pine needles to fall off, and eager but careless little fingers reaching for toy horns, candy canes, etc., breaking the ornaments.

After the holiday season was over, back to school went the children; then began the aftermath for the once gay little Christmas trees. Said mothers: "That tree must be taken out today and the room put in order again, before the children come home from school."

So the gay little Christmas trees were roughly stripped of their tinsel and pretty ornaments, dragged out of the room and thrown, bruised and broken, on top of a snow-drift, from whence they were later picked up by street cleaners and hauled away to the city dumping grounds.

Poor lonesome, forgotten little Christmas trees—this was the aftermath that followed their happy holiday season with children. I saw a truck passing our home this morning filled with ashes and on top of them were perched two bedraggled little Christmas trees being hurried to the city dumping grounds.

What an aftermath for these gay little Christmas trees, brought away from their birthplace on wind-swept hilltops in northern lands, to be placed in heated rooms; laden with tinsel and ornaments, made much of for just a few days, then tossed out to wither. It seems a sad fate for the dear little Christmas trees—but they brought much cheer and gayety to many homes that are dull and drab the rest of the year. If they brightened the world for a short time they have served their purpose. May you and I brighten our small corner and radiate cheer to others during our short lifetime here.



"Say, Bill—If these drop wires we put in last spring had only been Ironite, instead of that cheap imitation stuff, we wouldn't be doin' all this replacing this icy weather! For Ironite's so strong — like steel, nearly — it'll carry most any load of ice without breakin'. And it's so easy to work with too — ties tight, and splices firm as a weld."

Yes, IRONITE—Genuine Ironite—is nearly as strong as steel—the pure iron conductors, zinc coated by the noted "Crapo" process are not only strong (breaking strength, No. 18—170 pounds)—but, a drop wire length has a conductivity equivalent to No. 22 copper. Signals come thru clear and free of distortion.

And when price comparisons are made—well, Genuine IRONITE shows such marked economies, with its long life and high quality that there *just is no comparison*—Ironite shows savings of up to 20% over copper clad or bronze.

Note these points—

Wind swaying does not crystallize IRONITE.

Ice and sleet do not break IRONITE.

Heat or cold—sand or sleet have little effect on the insulation of IRONITE.

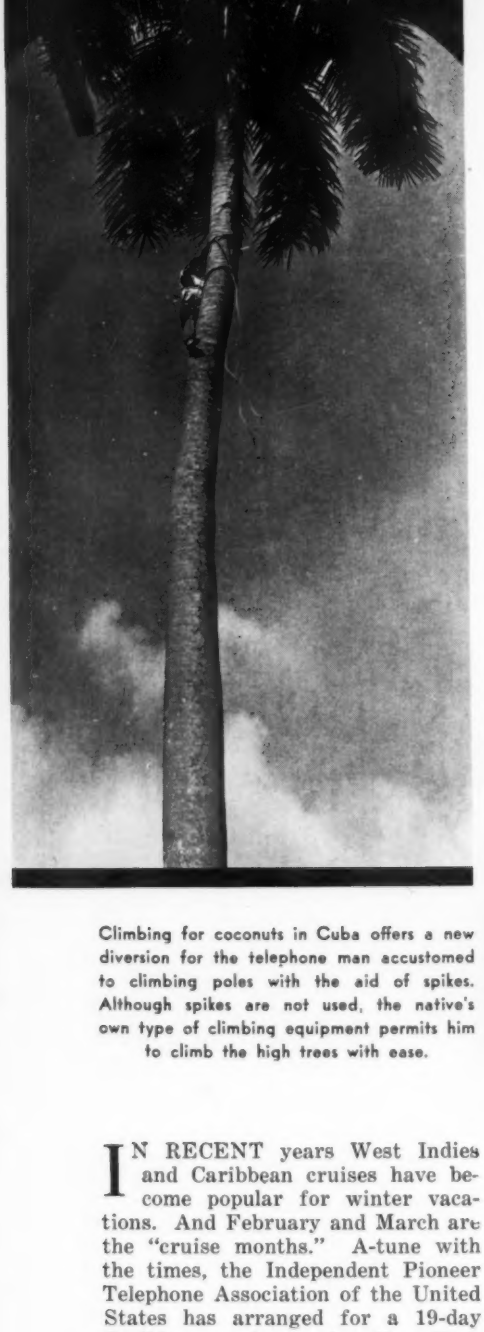
It is difficult to beat IRONITE Prices—

It is impossible to beat IRONITE quality.

Write for latest quantity price quotations on genuine IRONITE

PARAGON ELECTRIC CO.
37 West Van Buren St., CHICAGO

ONLY GENUINE IRONITE CARRIES THIS TAG



Climbing for coconuts in Cuba offers a new diversion for the telephone man accustomed to climbing poles with the aid of spikes. Although spikes are not used, the native's own type of climbing equipment permits him to climb the high trees with ease.

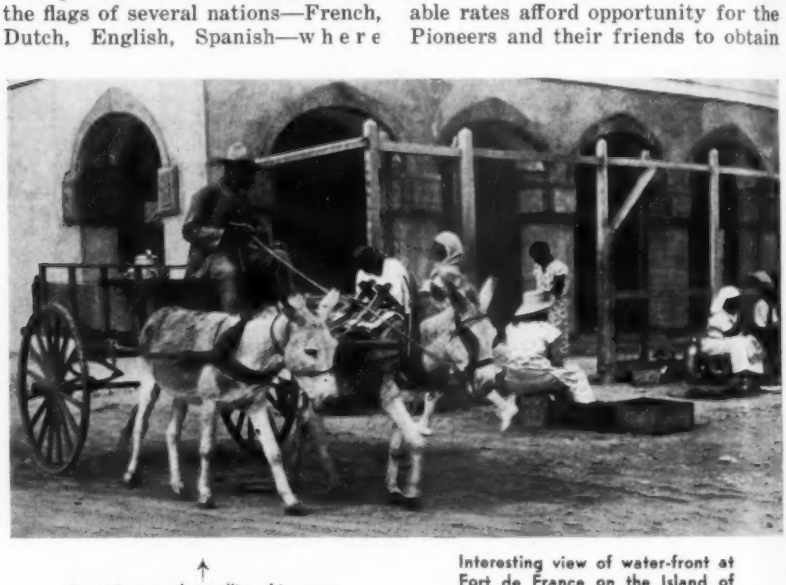
Independent Pioneers to Take Caribbean Cruise

LEAVING NEW YORK February 19, the Independent Pioneers will take a winter cruise to the "Spanish Main" and Caribbean Bowl. Empress of Australia provides many forms of entertainment and amusement enroute to ports of historic interest and to lands of strange customs, odd sights

IN RECENT years West Indies and Caribbean cruises have become popular for winter vacations. And February and March are the "cruise months." A-tune with the times, the Independent Pioneer Telephone Association of the United States has arranged for a 19-day Caribbean cruise leaving New York City on February 19.

Aboard the Empress of Australia, the Pioneers will find all kinds of amusements to occupy their time on the water during the four-day run to the first port—St. Pierre on the Island of Martinique, outpost of France. It's a tropical cruise, so the first morning after leaving New York the open air pool, with its surrounding space for sun bathing will be popular. Shuffle board, deck tennis, gymnasium exercises or loafing in a deck chair may occupy the day between meals. Entertainment and dancing fill in the evening hours.

Stops will be made at islands under the flags of several nations—French, Dutch, English, Spanish—where many sights of tropical countries are found. Shore excursions at reasonable rates afford opportunity for the Pioneers and their friends to obtain



A native vendor selling his wares on the streets of Willemstad, Curacao, which shows the Dutch influence. Willemstad will be one of the cruise stops.

Interesting view of water-front at Fort de France on the Island of Martinique, another scheduled stop for the Independent Pioneers' cruise next month.

close-up views of many interesting and historical places, buildings, trees, flora and people and their customs.

Stops are to be made at Bridgetown in the Barbadoes and Port of Spain in Trinidad, where the English flag has flown for years; Cristobal in the Canal Zone where side trips show the Panama Canal and Old Panama with the influence of old Spain still apparent; Kingston, Jamaica, with the traces of early Spanish Settlement and the later English influences; Havana with its historic Spanish atmosphere and night life.

Every port of call has its special scenes and they are constantly changing. The tropics will be at their best when the Pioneers visit them in late February and early March. And getting away from the rigors of northern winters with the advantages of continuous sunshine throughout the 19 days of the cruise are worthwhile considering by those thinking of a winter vacation.

"Travel light" is the advice given by one who has enjoyed the West Indies-Caribbean trips. And that means a couple of suit cases rather than trunks—and light garments only. Palm beach and linen suits are suitable for the men, and women, also, with accent on sports clothes for deck wear and a few evening clothes.

Reservations are now being made for the cruise of the Independent Pioneers and their friends on the Empress of Australia. J. K. Johnston, secretary-treasurer of the association, Lemcke Building, Indianapolis, Ind., will be glad to furnish complete information regarding the trip with details as to the rates for the cruise, the minimum being $217.50.

INTERESTING BITS OF HISTORY

Taken from "Telephony" of January, 1901

The first issue of TELEPHONY, then a monthly magazine, contains a brief history of the National Independent Telephone Association, forerunner of the present United States Independent Telephone Association.

It states that the National association was organized in Chicago, May 27, 1897; that the first convention was held June 22 and 23 of that year in Detroit and that it was attended by telephone men from nearly every state in the Union. The second and third annual conventions were held in Chicago and the fourth in Cleveland.

"Progress in Independent Telephony," is the subject of a feature article by the late Kempster B. Miller, one of the most prominent figures in the early days of Independent telephony and in later years one of the foremost telephone engineers in the country.

Independent Telephone Progress From Engineering Standpoint

In this article he states that "the progress in Independent telephony from an engineering standpoint has been truly phenomenal. . . . The indefatigable work of the manufacturers, financiers, engineers and patent lawyers have gradually brought within the reach of the Independent users a full line of efficient telephone instruments, multiple and divided switchboards, trunking systems, central battery systems, automatic signaling and lamp line signals.

"The two-lamp system of supervisory signals in connection with central battery exchanges is also available to the Independent user. . . . There are several Independent exchanges so equipped wherein 150 subscribers are allotted to each operator.

"The growth of the Independent telephone industry is scarcely realized by those who have grown with it, and certainly not at all by those not in the business. There are today between 3,500 and 4,000 Independent exchanges in the United States, operating in the neighborhood of 1,700,000 stations."

This first issue of TELEPHONY also contains:

A biographical sketch of Alfred Stromberg (deceased), one of the founders of Stromberg-Carlson Telephone Mfg. Co., and an article on "Wireless Telephony," by "Jim" Kelsey (deceased), for years a member of TELEPHONY's editorial staff.

A record of the granting to Frank R. McBerty, U. S. patent No. 665,923, on a "telephone appliance."

The obituary of Elisha Gray, contender for first honors as inventor of the telephone.

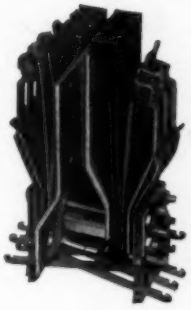
Story on the loading or inductance coil invented and patented by the late Dr. Michael I. Pupin (1858-1935). This invention, together with the two-way repeater circuit developed by Elwood Grissinger (deceased) and the three-electrode vacuum tube developed by Lee De Forest, made world-wide long distance telephone service possible.

An item in this issue states that in Germany the use of wooden bells for telephones is being adopted, owing to the disagreeable sound of metal telephone bells, particularly when there are a number of them in the same room.

COOK

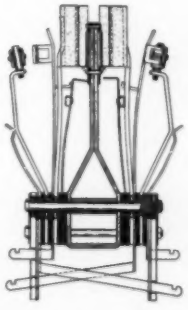
No. 3800

Central Office Protector



The Cook No. 3800 Central Office Protector is our latest design. It includes the ratchet type self-soldering coil, alarm circuit and cut-over and test springs. This protector operates to open the circuit and ground the line.

It is built in 51 and 101 pair sections. The pairs being spaced on 3/8" centers, give great economy in head-room.



COOK ELECTRIC CO.
2700 Southport Ave. Chicago

Always Specify
COOK
PROTECTION

Modernize Exchange Building; Install New Equipment

FOUR-POSITION switchboard installed at Council Grove, Kans., in completely modernized exchange building. Competitive telephone service was eliminated in 1936 when Council Grove Mutual Telephone Co. took over facilities of the Southwestern Bell

THE COUNCIL GROVE (Kans.) Mutual Telephone Co. was organized and began operations in 1906 to provide switching service for a large number of mutual companies operating rural lines in Morris County (of which Council Grove is the county seat).

In 1923, the organization was simplified and improved by merging the rural line companies with the original company. It then became an independent stock company. At this time, G. W. Coffin was elected president. Mr. Coffin, a wide-awake business man of Council Grove, had twice been a member of the Kansas legislature. He gave the company much of his attention and his plan of operation was endorsed by all the farmers' organizations of the county.

Except for competition with the Southwestern Bell Telephone Co., which had an exchange in Council Grove, offering service to the Bell toll system, the Council Grove Mutual Telephone Co. had no difficulties until the flood in 1929. This high water quite severely damaged its property and necessitated the rebuilding of the plant.

In the face of this disaster, the president secured the services of J. W. Admire, who had had 25 years of experience as a mechanic and was also an expert on cable and switchboard work. Under his direction, the system was rebuilt and improved by replacing the grounded system within the city with full metallic circuits and underground cable.

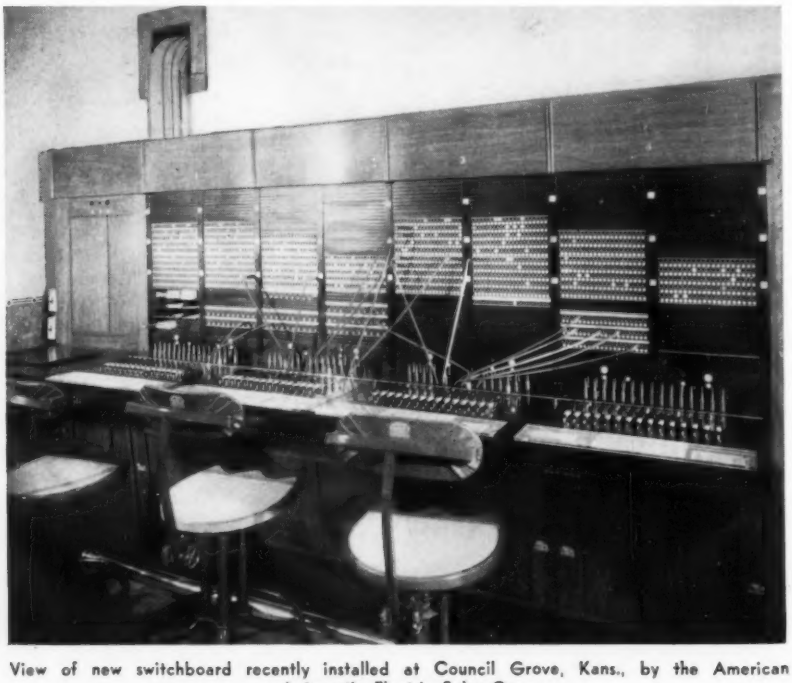
J. W. ADMIRE, manager of the Council Grove (Kans.) Mutual Telephone Co., has ably directed the affairs of the company for many years.

After this successful beginning in improving telephone service, a plan was devised for the purchase of the Southwestern Bell exchange in Council Grove and the consolidation of the two exchanges into one. This was accomplished in 1936 and the lines were merged on the Council Grove Mutual Telephone Co. switchboard, giving the people of the community a unified telephone service which is meeting with the approval of its patrons.

Orders were then immediately placed with the American Automatic Electric Sales Co. for a four-position Monotype senior switchboard, new central battery telephones for all subscribers within the city, and complete associated equipment, including MDF, power equipment, storage battery, charger and cabinet.

Work was also started on the modernization of the company-owned building, to properly house the new exchange. Late in 1936, the equipment was installed in this modernized building, and on January 1, 1937, the new system was cut into service.

The Monotype senior switchboard at Council Grove consists of four positions, equipped for 660 central-battery lines, 45 magneto rural lines, and 15



View of new switchboard recently installed at Council Grove, Kans., by the American Automatic Electric Sales Co.

toll lines. Selective harmonic ringing, using five non-multiple frequencies, is provided on the central-battery lines, and manual ringing on the magneto lines. There are 60 cord circuits, all of the universal type.

The exchange building has been completely modernized for its new purpose. The floor of the operating room is raised two feet above that of the terminal room, this arrangement making the rear of the switchboard readily accessible for inspection. The building is lighted throughout by modern indirect lighting fixtures.

From this new exchange, the Council Grove Mutual Telephone Co. is now serving 700 subscribers in the city, with central-battery service, and 300 rural subscribers, with magneto service. By arrangement with the Southwestern Bell Telephone Co. long distance service is also provided.

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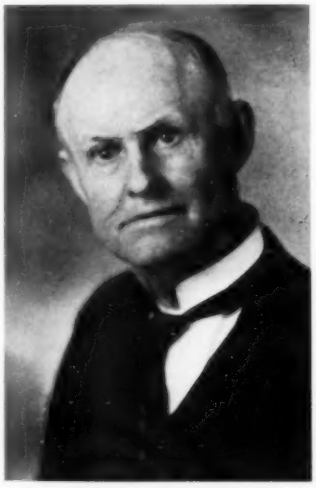
Preliminary Bell Report For 1937 and Last Quarter

Despite a downward trend in the last month of the year, the net income of the American Telephone & Telegraph



G. W. COFFIN is president of the Council Grove (Kans.) Mutual Telephone Co., which recently completely modernized its exchange building and installed new equipment.

Co. for 1937 rose to the highest level in its history. The earnings report, made recently to the company's stockholders by President Walter S. Gifford, shows net income of $179,761,000 for the 12 months ended December 31, 1937 (figures for December being partly estimated) equivalent to $9.62 a share, as compared with a net income of $174,826,414 in the preceding year, representing $9.36 a share on stock outstanding.

Last year the Bell System experienced a net increase of about 876,000 telephones, compared with a gain of 871,000 in 1936, a gain of approximately 6.5 per cent. During the last quarter of 1937 the net gain amounted to 170,000 telephones, compared with 274,000 in the last three months of 1936. On December 31 last, the Bell System had approximately 15,330,000 telephones in service. Toward the end of the year toll and long distance traffic were running at or slightly below the level of the corresponding period in 1936.

The operating revenues of the A. T. & T. Co. for the 12 months ending December 31, 1937, totaled $107,369,000; operating expenses, including taxes, $89,157,000. The net operating income of $18,212,000 for last year compares with $25,309,857 in 1936. The total income, including dividend income of $171,856,000, amounted to $197,734,000, as compared with $199,269,492 in 1936. After interest deductions of $17,973,000 and dividend payment of $168,181,000, there was a balance of $11,580,000 at the close of 1937, as compared with $6,745,235 in 1936.

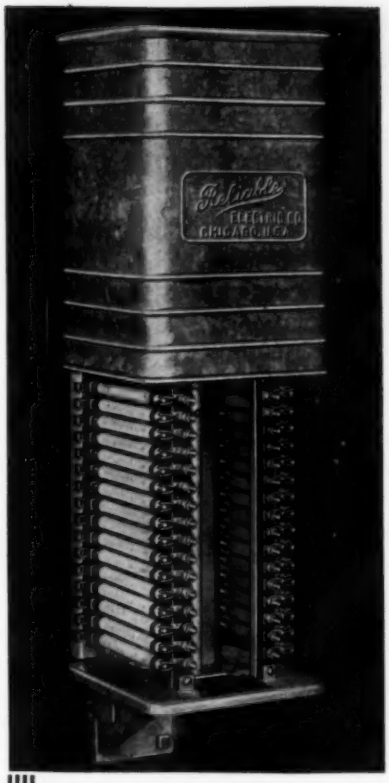
For the three months ended December 31 last the operating revenues of the A. T. & T. amounted to $26,944,000. Operating expenses, including taxes were $23,290,000; and net operating income, $3,654,000. The net income, including dividend income of $46,290,000, was $47,699,000, representing $2.55 a share on capital stock outstanding. This compares with a net income of 1936 of $60,247,697, $3.22 a share of capital stock outstanding.

The consolidated earnings report of the A. T. & T. Co., consolidating the accounts of the company and its 25 principal telephone subsidiaries for the 12 months ending November 30, 1937, showed operating revenues of $1,049,925,900; operating expenses, $703,097,099; taxes, $133,445,856.

The net operating income of $213,382,945 compares with $213,384,079 in 1936. Adding $32,838,960 in other income and subtracting interest deductions of $43,489,066, left a total net income of $202,732,839 for the 11 months' period in 1937 as compared with $191,062,587 in the same period in 1936.

The net income applicable to stock of subsidiary companies was $11,407,928 and net income applicable to A. T. & T. stock, $191,324,911, representing $10.24 a share. This compares with earnings of $9.54 a share in the same period in 1936.

The consolidated earnings report for the three months ending November 30, 1937, showed net operating income of $51,051,743, as compared with $58,059,924 in 1936. Total net income was $48,564,890, as compared with $53,721,798.



Reliable

PROTECTED CABLE TERMINALS

The all metal B-27 is modern and outstanding in design with added assurance of long "terminal life."

Made in three types for three standard cable terminal fuses. Upon request we will send a sample for your inspection without charge.

Reliable ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
2145 CARROLL AVENUE • CHICAGO, ILLINOIS

The two-wire and three-wire Kellogg connector blocks and covers.

The Manufacturers' Department

New Connector Blocks of Kellogg Company

A connector block for connecting the telephone cord to the line wire leads has recently been introduced by the Kellogg Switchboard & Supply Co. of Chicago. The use of these low-cost blocks, it is stated, saves installers' time and assures fool-proof connections. Connections are made quickly and easily and eliminate the need of soldering and taping.

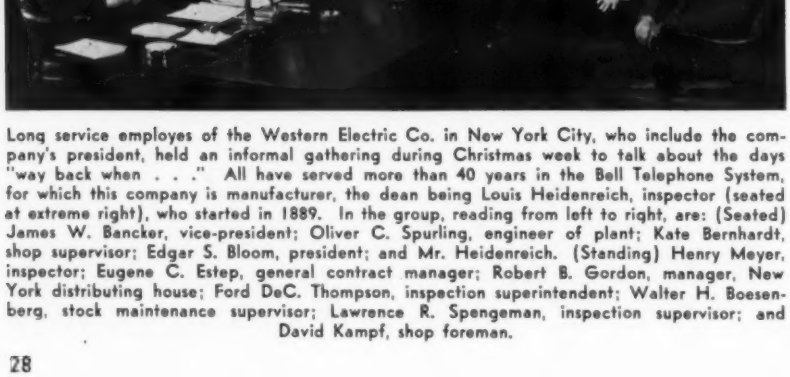
Kellogg connector blocks are made in two sizes—the two-point block for connecting two wires, and the three-point block for connecting three wires. They are furnished with or without cover as desired. The blocks are quickly attached in any position and in almost any place with ordinary wood screws. Countersunk screw holes eliminate possibility of short-circuits across the screw heads.

Connections are quickly and easily made by simply inserting the cord tips or wires and tightening the binding screws. The conductor blocks take all types of cord tips and all sizes of wire.

The one-piece block is made of moulded Bakelite with separators and slots to hold the cord tips in place and prevent them from shorting or moving. The connector bars are moulded right in the Bakelite so that they cannot loosen or come off. The bars, binding posts, gripper plates and cover are brass—the cover being black enameled.

The U-shaped gripper plates face upward when spade tips are used. For spike tips or wire, the gripper plates need only be turned over. In either case, the raised Bakelite shoulder down the center of the block assures correct position of the plates and the conductors so that there will be no cross-connections. The sturdy brass binding posts are long enough for making easy connections and will not trip when tightened down.

The two-point connector block has a moulded lug on each side, and the three-point block has two moulded lugs on each side. These lugs act as reinforcements to the block and at the same time provide a means to fasten stay cords.



Long service employes of the Western Electric Co. in New York City, who include the company's president, held an informal gathering during Christmas week to talk about the days "way back when . . ." All have served more than 40 years in the Bell Telephone System, for which this company is manufacturer, the dean being Louis Heidenreich, inspector (seated at extreme right), who started in 1889. In the group, reading from left to right, are: (Seated) James W. Bancker, vice-president; Oliver C. Spurling, engineer of plant; Kate Bernhardt, shop supervisor; Edgar S. Bloom, president; and Mr. Heidenreich. (Standing) Henry Meyer, inspector; Eugene C. Estep, general contract manager; Robert B. Gordon, manager, New York distributing house; Ford DeC. Thompson, inspection superintendent; Walter H. Boesenberg, stock maintenance supervisor; Lawrence R. Spengeman, inspection supervisor; and David Kampf, shop foreman.

Automatic Small Exchange's Emergency Line Ring

The Colon (Neb.) exchange, located in the Wahoo area of The Lincoln Telephone & Telegraph Co. was cut from manual to automatic, or dial, operation at 1:30 p. m., Tuesday, November 2. This was the first of six such conversions scheduled for various points in the Lincoln company's territory during the late fall and early winter. Equipment installed in the Colon office was manufactured by the Automatic Electric Co. of Chicago.

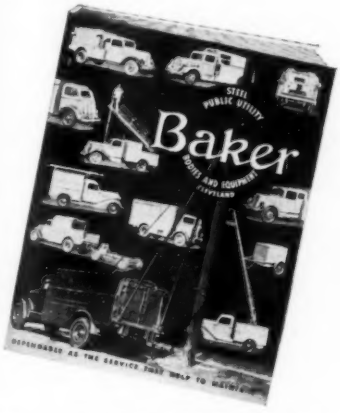
This particular CAX unit is designed to accommodate 100 lines, of which 50 are in use at the present time to serve 90 town and rural subscribers. A feature of the new service is an emergency line ring which can be dialed by any Colon subscriber. The equipment was installed in the company-owned frame building which formerly housed the manual equipment and operator's living quarters.

The rear portion of this building has been demolished and the remaining portion painted and repaired. Collection on subscriber accounts are being handled through the State Bank of Colon.

New Baker-Raulang Catalog of Utility Bodies

A new catalog of the Baker-Raulang Co., Cleveland, Ohio, which will be issued shortly, is by far the largest and most complete one the company has ever issued.

There are several new utility bodies shown—several new sizes of each model. Each body described embraces a number of improvements and refinements found practical in the daily use of their predecessors. For example, the new weathertight doors are definitely weatherproof—being made so through a new and exclusive Baker patented construction. Water, rain, or



New catalog of Baker-Raulang Co., Cleveland, Ohio, is unusually large and complete, showing many new bodies of interest to public utility companies.

wash, it is claimed, just cannot get into the compartments covered with the new Baker weathertight doors.

Safety is achieved in a new and greatly-improved method of general overall body design. In a most practical manner the pike poles and derrick legs are wholly enclosed, and the ladders are recessed within the outside body line; placing Baker bodies ahead of various state highway safety regulations.

A new line of crew-carrying cabs is included in the catalog. Baker all-steel line bodies are efficiently designed for crews of five, six or seven men; and for use on either the conventional type of chassis or the newer cab-over-engine models.

The new Baker trailers are also shown for the first time: pole trailers, cable splicing trailers, line material trailers and pole dinkey. Also shown is a full line of electric utility winches, power take-offs and derricks.

This new, loose-leaf, hard-cover Baker catalog is complete with information for construction men and it should be of real interest to them.

Lincoln (Neb.) Company's Small Automatic Exchanges

Three exchanges in the territory served by The Lincoln Telephone & Telegraph Co. in southeastern Nebraska were recently cut from manual to automatic service as a part of the company's plan to convert six of its smaller towns to dial operation within the near future. The first of these conversions took place early in November at Colon.

The telephone company's exchange, located in the town of Panama in Lancaster county, was switched to dial automatic service on November 23, at 9:30 p. m., with the mayor of the community removing the blocking strips.

The equipment was made by the North Electric Mfg. Co. and has an ultimate capacity of 100 lines. It is now equipped for 50 lines and is serving 40 town and 70 rural subscribers, with trunks connecting the exchange to Bennet, Hickman and Firth. Toll calls are routed to the Lincoln toll center via the Bennet exchange.

Conversion to automatic service at Filley took place on December 21, at 9:30 a. m. This particular unit is designed to accommodate 60 lines and is equipped for 40 lines. All toll trunks are routed through Beatrice. The equipment, manufactured by the North Electric Mfg. Co. and serving 65 subscribers at present, was installed in the company-owned frame building which formerly housed the manual equipment and operator's living quarters. The building was completely repainted and repaired.

Automatic equipment was also installed at the Lincoln company's Ithaca exchange and was cut to service on Saturday morning, December 11. It was purchased from the Automatic Electric Co. and has a capacity of 100 lines, being equipped at present for 50 lines. The new CAX unit, which serves 71 subscribers, was installed in rented quarters next to the Ithaca postoffice. All toll trunks are routed through Wahoo to the Lincoln toll board.

In addition to the usual ringing on these three dial exchanges, provision has been made for any individual subscriber to place an emergency ring on his or any other exchange line. This line ring has already proved invaluable in cases of emergency.

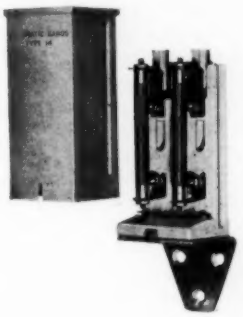
▼ ▼

Operators Rank High in Diction and Enunciation

In a message to the annual meeting of the Association of Teachers of Speech, held in London, England, George Bernard Shaw rated telephone operators above actors and actresses in diction and enunciation.

SANDS

THE TYPE 14 SUB-STATION PROTECTOR



An enclosed weatherproof substation protector, easily accessible and ruggedly built for either indoor or outdoor use. Mounting bracket is reversible, permitting exposed or concealed mounting, as desired. Regularly equipped with two 5-ampere fiber-enclosed fuses and two Type 2105 discharge blocks. Write for information on this and other Sands protective devices.

SANDS PROTECTION EQUIPMENT
is made by:

AUTOMATIC ELECTRIC COMPANY

Distributed by:
AMERICAN AUTOMATIC ELECTRIC SALES CO.
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Commission and Court Activities

FCC Telegraph Hearing To Begin February 14

With the immediate objective of investigating the petitions of the five major wire and radio telegraph companies to increase domestic rates by 15 per cent and the implied ultimate objective of embarking upon an extensive inquiry into the situation of the entire telegraph industry, the Federal Communications Commission fixed February 14 as the day for the opening of hearings. Commissioner T. A. M. Craven issued a vigorous dissenting opinion to the order adopted January 11 and made public two days later.

The companies petitioning for rate increases are Postal Telegraph-Cable Co., Mackay Radio & Telegraph Co. (California), Mackay Radio & Telegraph Co. (Delaware), Western Union Telegraph Co. and RCA Communications, Inc.

In his dissenting opinion, Commissioner Craven said that two inquiries were needed, one at once by a hearing limited to the immediate rate situation, as the companies had petitioned that they were in a "highly critical" financial situation, and the other an extended investigation "of the major and more fundamental problems involved in the existing communication structure of the country."

"In my opinion," said he, "the order designating the foregoing petitions for investigation and hearing permits an expansion of inquiry to include undefinable matters not clearly specified. I recognize, however, the need for a hearing on limited issues, because the petitions appear to make out a prima facie showing sufficient to warrant an investigation and hearing limited to the issues therein presented.

"They recite that the situation of the carriers is highly critical and, unless properly met by an increase in their revenues, their ability to function will be seriously impaired.

I respectfully submit that it is necessary for the commission to conduct a thorough investigation of the entire communication structure of the United States for the purpose of assisting in the determination of a modern national communication policy for the nation.

It is specifically necessary for the commission to study related competitive and economic factors which, at present, seem to indicate a trend toward a monopoly of communications rather than the competition contemplated by the Communications Act of 1934.

Hence it appears to be in the broad interest of the public to limit the issues in the hearing on the petitions to the questions raised directly in the petitions and to formulate forthwith a preparation for a comprehensive and basic investigation of the major and more fundamental problems involved in the existing communication structure of the country."

The commission's order states that it may enlarge and expand the inquiry into the application of the five telegraph and radio companies "so as to receive and include testimony taken in docket 2639 (Order No. 12 in the spring of 1935), and evidence which may have come into existence since that hearing upon the matters therein involved; and also so as to receive and include evidence upon any other matters which may have a bearing upon the increase in rates and charges proposed."

▼ ▼

Handset Charge Eliminated by Michigan Bell

The Michigan Public Utilities Commission, December 31, ordered the Michigan Bell Telephone Co. to abandon monthly rental charges for handset telephones and to eliminate the extra charge for desk set telephones in rural areas, effective January 1.

The company had charged 15 cents a month for the handset telephones for a period of 18 months, after which there was no extra charge. It had charged rural subscribers using desk telephones in certain areas 10 cents a month for 18 months.

The commission estimated a saving to subscribers, by removal of these charges, of $325,000 a year.

In a statement accepting the commission's order, President G. W. Welch of the telephone company said the reduction in revenue was not justified. The company was accepting, he added, "because of our desire to cooperate with the commission in determining a distribution of charges for

Answers to Traffic Questions on Page 16

1. The minute or minutes of conversation beyond the initial period of three or five minutes.
2. Say, "(Name of your office) (called number) BY. I will hold this circuit."
3. The terminating toll center TX.
4. Please refer to preface for the answer to this question.
5. If, when the called station answers, you reach the desired department (for example, on a call to "7981, Parts Department") this would constitute a station-to-station call; that is, if the called station answers by saying "This is the Parts Department," or "This is 7981."

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telephone services that will be acceptable to our customers."

In brief, the order requires and authorizes:

Elimination of the charge of 15 cents a month for 18 consecutive months made for the handset telephone.

Elimination of the charge of 10 cents a month for 18 months made on upright desk telephones in certain rural sections.

Continuation of present charges for instrument changes, except in the cases of new customers on whose premises an instrument already is in place. The charge in these cases is reduced from $1.50 to 75 cents in Detroit and correspondingly elsewhere.

▼ ▼

Sought to Incur Debt for Stock Dividend

Application of the Bonduel Telephone Co., Shawano county, to incur $10,000 of debt to declare a stock dividend was denied by the Wisconsin Public Service Commission January 11 in ruling on the first such request ever made.

The company received commission authorization, however, to declare a $10,000 stock dividend out of surplus, and the way was left open for the company to get authority for an additional $10,000 stock dividend out of surplus. A surplus of $26,004 was reported on hand December 31, 1936.

The company's proposal to issue $10,000 of certificates of indebtedness in order to pay a $10,000 stock dividend and leave part of the surplus for cash on hand would not give reasonable protection to purchasers of securities to be issued, the commission stated.

"The company proposes to say to the security-holder, 'We hope to pay you the principal amount sometime; maybe we will pay you some interest, but you can't force us to do it,'" the commission commented, adding:

"Conceivably, a corporation may have a sizeable surplus today, but through the vicissitudes of business, this surplus may have turned to a large deficit when the maturity date of any bond dividend arrives. The company would then be in a position of being compelled to actually pay the cash for its dividends at a time when its capital was impaired.

It would appear obvious that this method of gambling with the future fortunes of the company is not a sound financial policy and should not be countenanced by this commission.

The long-established practice of this commission has been to disapprove of the issuance of any other type of securities, as a dividend to common stockholders, than common stock. We see no reason at this time for any change in this policy."

▼ ▼

Rate Increase to Empire (Minn.) Company

The Empire Telephone Co., operating 159 local and 249 rural stations at Dassel and vicinity, was given permission by the Minnesota Railroad & Warehouse Commission, in an order handed down December 14, to increase its rates, effective January 1. The new schedule of monthly rates which follows represents increases ranging from 25 to 75 cents, the gross rates quoted being subject to a 25-cent discount for prompt payment:

	Gross
Individual line business	$3.00
Two-party line business	2.50
Individual line residence	2.00
Four-party line residence	1.75
Rural multi-party	2.00
	Net
Extension stations—business	.75
Extension stations—residence	.50
Extension bells	.25
Handsets—town (additional)	.25
Desk sets—rural (additional)	.25

Temporary disconnections — one-half regular rate for any class of service.

The company is authorized to make an additional charge of 25 cents per month to the rates quoted for common battery service in town.

The commission found that the company's current rates were inadequate and that the company's average per station maintenance expense for the past five years has been $1.97, as compared with $4.70 for 52 class C companies and $4.50 for 64 class D companies.

It is estimated by the company that the new rates will yield a return of 4.96 per cent on the investment, as compared with 3.2 per cent under the present rates.

▼ ▼

Further Delay in Ohio Bell Rate Case

Indications at this time point to further delay in the rehearing of the 15-year-old Ohio Bell Telephone Co. state-wide rate beyond the time which had been tentatively set by the Ohio Public Utilities Commission for January 18. Both company officials and representatives of the state attorney general's office have made it known they can not be ready by that time.

W. W. Metcalfe, an assistant to Attorney General Herbert S. Duffy, stated that the state would be unable to complete its preparations for the case before the latter part of February. He

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indicated, however, that conferences will continue to be held with the telephone officials in an effort to agree on a method of presenting property valuation evidence that will make it possible to try the case on a state-wide basis instead of in 45 separate exchange area hearings.

The case was remanded back to the Ohio Supreme Court some months ago by the United States Supreme Court, and it was then sent back to the public utilities commission for rehearing.

▼ ▼

Ohio Tax Refund Ordered to A. T. & T. Co.

The Ohio Tax Commission on January 6 ordered the state to refund $46,981 collected from the A. T. & T. Co. in excise and poor relief taxes in 1932, 1933, and 1934. The commission upheld a protest by the company against collection of the tax on contracts between it and The Ohio Bell Telephone Co. and the Cincinnati & Suburban Bell Telephone Co.

▼ ▼

Company Dividend Forbidden Pending Investigation

Declaration of a common stock dividend by the Community Telephone Co., Black River Falls, Wis., scheduled for January 15, was forbidden by the Wisconsin Public Service Commission until the commission can investigate company affairs and hold a hearing on the matter.

The company, operating 35 telephone exchanges in Wisconsin, is owned by an out-of-state company, the Inland Telephone Co. Included in exchanges it operates are those of Walworth, Black River Falls, Wautoma, Clinton, Colfax, Darien, Prescott and Elk Mound.

The telephone company also has pending before the commission an application to increase its rates in Osseo, Galesville, Blair, Ettrick, Whitehall, Centerville, Arcadia and Trempealeau.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

H. Sigalet & Company, Ltd., Lumby, B. C., Canada—Western Red Cedar Poles. Plain or butt-treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

▼ ▼

Summary of Commission Rulings and Hearings

Federal Communication Commission Washington, D. C.

January 3: New Jersey Bell Telephone Co., Newark, N. J., granted authority to supplement existing facilities between Swedesboro and Woodstown, N. J., a total distance of 4.6 miles.

January 11: The commission amended the revised uniform accounting system instruction on the carriers' completion of the plant continuing property record to be extended from December 1, 1937, to June 30, 1939. Thus telephone companies will continue the present property record without specific requirements until June 30, 1939. The commission thus indicated that no definite action on the telephone continuing property record system is expected from state commissions in the near future.

March 2: Hearing before an examiner on application of the Indiana Bell Telephone Co., Indianapolis, Ind., for a certificate to purchase the Dugger Mutual Telephone Co., Dugger, Ind., under Section 221 (a) of the Communications Act.

Idaho Public Utilities Commission

December 30: Mountain States Telephone & Telegraph Co. ordered to eliminate the extra charge of 15 cents monthly for handsets, effective January 1. The commission's order specifies, further, that after four years all desk and wall type instruments must be replaced by handsets. It is estimated that Idaho subscribers will save $20,000 a year.

Illinois Commerce Commission

January 18: Hearing in Springfield on complaint of the Kiwanis Club of Vienna against the Illinois Commercial Telephone Co. as to telephone service and equipment in Vienna.

January 18: Hearing in Springfield on complaint of the board of trustees of the village of Shiloh against The Smiley Bros. Telephone Exchange of O'Fallon and the Southwestern Bell Telephone Co. concerning telephone service in the village of Shiloh, St. Clair County.

Michigan Public Utilities Commission

December 31: Michigan Bell Telephone Co. ordered to eliminate the 15-cent monthly charge for handset telephones and also the 10-cent monthly charge for desk set telephones in rural areas. The order became effective January 1 by agreement.

The commission estimated the order would save subscribers about $330,000 a year.

February 2: Hearing on commission's order that the Michigan Bell show cause why it should not revise its long distance rates. The hearing was originally set for January 6 but was postponed to this date at request of the company.

Missouri Public Service Commission

January 13: Complaint filed by the Western Light & Telephone Co. against the Lewis County Rural Electric Cooperative Association alleging interference with telephone service.

Ohio Public Utilities Commission

January 6: Order issued authorizing the Ohio Associated Telephone Co. to increase rates in the communities of Morral, Waldo and Green Camp. Permission for the rate increases was granted after commission engineers revealed that the company was operating at a loss in these communities.

January 14: Following a hearing on application of the Warren Telephone Co., order issued authorizing the company to increase its rate for service to subscribers. In its application as originally filed, authority was asked to increase rates on all types of service, but later this application was amended in which five-party line service and rural business and rural residence service were eliminated from the increase sought.

At the hearing on the application, no protest of any kind was offered against the increase in rates.

Pennsylvania Public Utilities Commission

January 7: Dr. R. W. Stevens, of Wilkinsburg, filed complaint against the Bell Telephone Co. of Pennsylvania, alleging that the company's rate schedules in Crescent Hills, Allegheny County, were "unfair and excessive."

Wisconsin Public Service Commission

January 11: Application of the Bonduel Telephone Co. to incur $10,000 of debt in order to declare a stock dividend denied. Company authorized to declare a $10,000 stock dividend out of surplus. The company's proposal to issue certificates of indebtedness in order to pay a $10,000 stock dividend and leave part of the surplus for cash on hand, would not give reasonable protection to purchasers of securities to be issued, the commission stated.

January 15: Order issued forbidding the Community Telephone Co., Black River Falls, to declare a common stock dividend until the commission can investigate company affairs and hold a hearing on the matter.

Wyoming Public Service Commission

January 3: The commission ordered the Mountain States Telephone & Telegraph Co. to eliminate the 15-cents-a-month extra charge for handsets. The company is authorized to collect an installation charge of $1 for changing the type of instrument.

HERE AND THERE IN THE FIELD

(*Concluded from page 23*)

round for about three Blocks to the Dean or Parsons and take his Nichols with him, then Neil down and Crowner queen of his Hart.

The Abbott continued his good advice by saying: 'You can't tell what might Hap, so show your Manners and don't Crouch down. Go Hunt the Holmes you can find furnished with Sheets and Matz, and hire a Butler and some Good Cooks who Boyle the Beans and Rice and seldom Behrens them.'

And to our Cozad friends we offer this word of advice—don't get Grim because of dry weather—just look at the Wells of sparkling Waters around you. One of them might be Jacobs and you don't know what might Hatch out of it. Now be Frank and tell us—can you suggest any Moore?"

▼ ▼

Anniversary of Opening of First Exchange

Next Friday, January 28, will be commemorated the 60th anniversary of the opening of the world's first commercial telephone exchange — established in the city of New Haven, Conn., by George W. McCoy, in 1878. When the switchboard was first placed in service, it had eight lines in operation, serving 21 subscribers. The rate at that time was $18 a year.

In 1877 when Alexander Graham Bell was making public lectures and demonstrations of his invention Mr. McCoy was manager of the Atlantic & Pacific Telegraph Co. in New Haven, Conn. In fact, he furnished the wires and batteries for the inventor's demonstration in his own community and was greatly impressed with the demonstration of the telephone and was quick to see its commercial possibilities.

Securing a telephone franchise in New Haven in September, 1877, Mr. McCoy set to work to devise a switchboard for the establishment of intercommunication between telephones at comparatively widely-separated locations. By January 28, 1878, he succeeded in placing the switchboard in operation, as mentioned previously. The New Haven exchange later became a part of the Southern New England Telephone Co., a member of the Bell System.

A bronze plaque was placed on the site of Mr. McCoy's exchange 10 years ago by the Southern New England company to commemorate the establishment of the world's first commercial telephone exchange.

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Singer's Long Distance Bills Run High

Sheila Barrett, singer, is said to be the most extravagant individual user of the long distance telephone. Some weeks her bills aggregate $500.

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